

RESEARCH

Schools can help pupils, Bristol study shows

by Peter Wilby

Which characteristics had the greatest influence on the variations between schools? No single block, taken on its own, had any significant influence. They only explained variations when combined with others.

The analysis then showed that parental background was the least accurate predictor of differences between the schools' achievements in eight of the 11 subjects. The characteristics of the schools and the teachers were, in general, better predictors, though the differences between the five blocks were rarely striking. In seven subjects, the best predictors were either the teachers or the schools. The influence of the teachers was particularly marked in French, chemistry, maths and German.

When the total explained variation in results was analysed, including both between-school and within-school differences, individual characteristics proved to be much the best predictors of achievement. This is much as one would expect, and individual characteristics must reflect family characteristics. But, again, it is striking that parental background itself rarely stands out (as Coleman might lead one to expect) as a reliable predictor. The teachers, either uniquely or in common with other blocks, accounted for as much as one fifth of the variation in results in chemistry, maths, physics, French and English language. The schools accounted for a similar proportion of the variation in French, geography, chemistry, maths, physics and English language.

Parental background, however, accounted for more than a fifth of the variance in only three subjects and only in biology did it emerge, marginally, as the second best predictor.

What particular teacher characteristics lead to good results? In maths, subjects where teacher influence was particularly marked, high achievement was associated with specialized teachers, who did not teach in other D-level subjects. The use of past examination papers for timed exercises and the use of lecture methods in teaching were associated with low achievement. But, overall, the data failed to produce a picture of the "ideal teacher".

One of the most curious results was that the use of films and television, where significant, was always associated with low achievement. Yet the availability of audio-visual aids (a school characteristic) was correlated with high achievement. Parents, however, should not conclude that the ideal school is one with many unused audio-visual aids. The Bristol researchers emphasize that the results cannot be used to make generalizations about British schools.

What they do show is that a multitude of interesting variables contribute to pupil achievement and that, among these, the characteristics of individual schools and individual teachers may play a more important role than previous studies have suggested.

Coleman and Jencks reported that very little of the variation between children's educational performances was attributable to differences between schools. The apparent contribution of teachers and teaching to academic performance was negligible. In some cases, better school facilities appeared to have negative effects.

The impact of Coleman's findings, published in 1966, was so great that education in North America has had to struggle for increased public funding ever since. In particular, the cause of positive discrimination in favour of poorer children received a serious setback.

The Bristol team, headed by Professor Alan Briner (now professor of education at the University of Hong Kong), set out to replicate Coleman's research in a more scientific and limited field. Where Coleman used general tests of verbal and numerical ability, the Bristol researchers used O-level results. Because the examinations demanded specific knowledge, it was thought that these might show up differences between schools more clearly.

Of 11 O-level subjects, there was between two and a half times and five times as much variation in results within the 44 schools in the sample as there was between them. The greatest between-school variations were in maths (42 per cent) and English language (37 per cent).

The researchers tried to explain the variations through blocks of characteristics—teacher characteristics (such as age, sex, experience, qualifications and teaching styles), school characteristics (size, type, sex, social class composition, pupil-teacher ratio, premises), parental background (father's occupation, parents' education, help given with school work), individual pupil characteristics (aptitude, self assessment of brightness, time spent on study), and the pupils' perceptions of their schools (strictness, emphasis on behaviour and academic success).

These predictors accounted for nearly all the variation between the schools' results, though they generally accounted for less than a third of the variation within schools.

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Females hold clue to fig wasp behaviour

by Clive Conkman
science correspondent

Two types of fig wasp live together amongst the wild figs of Brazil. In one the males share the females peacefully. In the other they fight lethally between themselves: millions of males in combat every day to mate with the few females.

Imperial College entomologist Dr J. Hamilton believes this astonishing difference in aggressiveness can be explained by the different egg-laying habits of the females.

In the first group of species, the "pollinator wasps", each female lays all its eggs in one fig. When the broods emerge inside the fruit the males are largely competing with brothers to mate with sisters, and they do not fight.

In the other group, the "parasitic" species, females lay eggs

singly or in small batches in different figs. The males are less related to others within the fruit, and they fight viciously for the females.

Dr Hamilton (who accepts the label "sociobiologist") began studying Brazilian fig wasps when he was working at the University of Sao Paulo in 1975. "It is an amazing and undiscovered world, quite isolated from the rest of biology", he says. "One can get wrapped up in figs for the rest of one's life."

There are about 600 wild fig species in the world, and each one supports an average of 10 different species of wasps. Dr Hamilton estimates, making a total of perhaps 6,000 sorts of wasp for entomologists to sort out.

These creatures, no more than a couple of millimetres long, are categorized as wasps for want of a

better name, but are more closely related to certain parasites of caterpillars. They look a little towards scientific stardom when Hamilton's work was exhibited at Royal Society since last week.

The interpretation of the contrast in aggression between fig wasps in terms of genetic kinships, is particularly clear illustration of a recurrent problem in biology: do some animals devote more energy than others to competition within the species?

Fig wasps also provide the most startling examples of dimorphism discovered in any animal. Brothers are so different in parasitic species that taxonomists would place them in different genera if they did not know they had the same parents. They are both in aggressiveness and size—usually, the males have long and others do not.

Skull 'may be first European'

by Frances Gibb

Scientists at Edinburgh University are trying to establish whether a human skull found 15 years ago in a Greek cave could be that of the first-known European man.

The skull, found in Petrolona, Cova south of Solonica, was originally thought to be Neanderthal, a race which lived between 11,000 and 35,000 years ago.

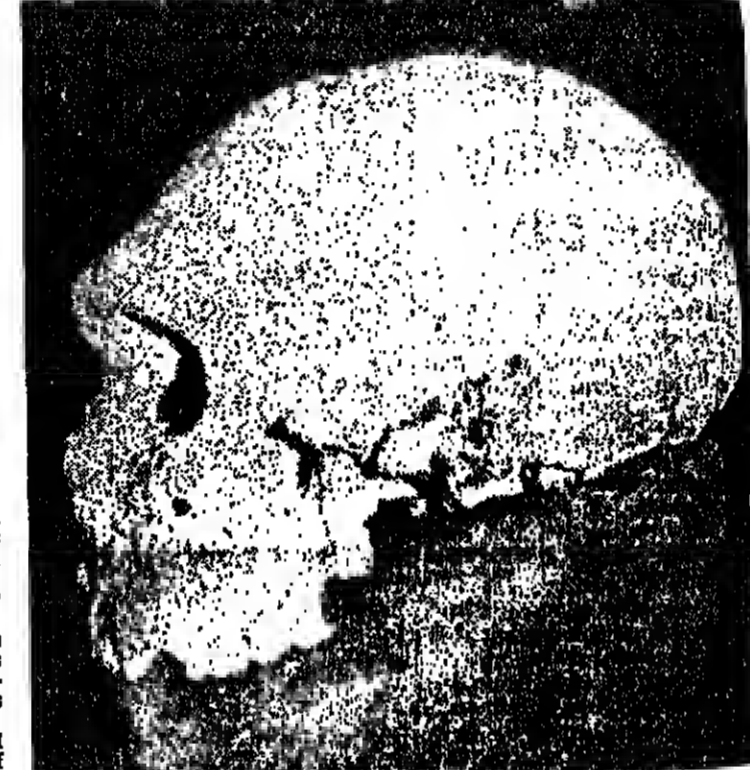
Dr Aris Procopiou, head of the Greek Anthropological Association and the cave's excavator, believes the skull is much older, which would prove that south-eastern Europe was occupied by man very early.

Together with the Scottish National Museum, the geophysics and physics departments of the university are trying to apply dates for the site.

One method, which was pioneered by Professor K. M. Creer, head of the geophysics department and Professor J. S. Koppa, a visiting fellow in the department from Long Island University, New York, involves the use of palaeomagnetism.

The magnetic history of the sediments is reconstructed using samples of cave earth. Since the earth's magnetic field changes with time and since the field reversed itself at known intervals in the past, it is often possible to date not only specific levels but also to establish a sequence of time through the analysis of the magnetic field.

So far, Mr Stavros Papanarinos, a research student in the geophysics department, has discovered that the Petrolona Cova material is more than 650,000 years



Greek skull found in cave near Salonicca

old and is now trying to establish the magnetic stratigraphy.

At the same time Dr Robert Galloway, of the physics department, is carrying out measurements on similar magnetic material from the deposit to help establish a date for these layers using the isotopic decay rates of uranium/thorium.

The National Museum of Antiquities of Scotland is engaged in other dating techniques, and the results of all methods will be compared. A portion of the stalactite which is said to have carried the skull has been independently dated in Japan as 250,000 years old using electron spin resonance. Another portion

has been dated in Canada as 200,000 years old by the uranium/thorium method.

The cave was discovered in 1960 when Christos Sarantis, then a student at the University of Athens, was told by a shepherd that he had heard water running underground. Serious work was begun in 1961 and the cave was excavated in 1968, by which time the skull was lost, but recently another skull has been discovered embedded in calcite.

Bath examines computer's use

A Bath University team is to examine how a national computer record of library books and periodicals can be used locally by university and public libraries.

With an £88,000 grant from the British Library the team, under the direction of Mr John Lambie, the university librarian, will look at the central computer service being set up by the British Library and see what use can be made of it. The work may eventually lead to the setting up of a world-wide network of computerized catalogues.

Multinationals studied at UEA

A team led by Professor Alice Teichova, of the University of East Anglia, is shortly to start a three-year project in the economic history of central Europe. By means of a £25,000 grant from the Social Science Research Council it will trace the growth of multinational companies in the area after the First World War.

Bath library has already done much work with the university's computer unit on the use of computers in library cataloguing. Its own library is already fully computerized.

One advantage of such cataloguing is the saving of calories: 50 per cent at Bath instead of the normal 65 per cent.

The team also hopes to do further work on finding books through a keyword index system.

Exeter physicist aims to help speech defects

Sufferers from speech defects could benefit from a £13,000 research project just started at Exeter University by Dr F. C. Fleck.

In his department of physics, Dr Fleck is attempting to improve the quality of measurements of air flow through the nose which are of use to speech therapists in assessing patients' progress.

The research will study the usefulness of an instrument which measures nasal anemometer which measures the escape of air from the nose through a nasal cannula which is fitted with "hypersens" speakers which are unable to close off the nasal passages.

In his project Dr Fleck will attempt to measure the anemometer and discover how useful it is to speech therapists in assessing patients' progress. The work will be financed by South Western Regional Health Authority.

On the other hand

Would ewe do it?

Bristol University's information officer was quite brazen about it. "We are going to hold sheep grazing research" he said, and he was not believed.

In one of those inspired moments of dizziness which make our legal profession hours to think up, the university has been told that it will be stripped of its ancient right to graze sheep on Bristol's Durdham Downs unless it is exercised forthwith.

As commuters of the downs—a charming expanse of parkland by the Clifton suspension bridge—move normally used for the exercise of dogs and the right to free speech than for sheep fattening—the university has not unleashed the slightest hint of mutton there since 1924.

However, its general purposes committee, ever stickler for tradition, has recommended that this university council drops a lamb or two as far away from the golfers and ice cream vendors as possible. "It will be a more grazing really," said the information officer, Mr Don Curleton, by way of mitigation, "but there will be a valid academic by-product". A member of the botany department will, it seems, be using the heavy-duty opportunity to examine what happens to sheep's digestion when surrounded by people flying kites, or something along those lines.

Another by-product is that Bristol has become a university where puns may safely be clearly prepared in themselves for the arrival of the *Daily Mirror* at the grazing ceremony, academics and students alike are nowadays full of quips like: "We may be woolly minded but universities will not be so." "There is a lot of it about," said Mr Curleton. "You know, jokes about sheepishness, that sort of thing. It is a surprising ramification."

The book, *Heather in My Ears*—which eccentric affliction he at no point explains—follows *Salt in My Popcorn* and *Ranker in My Scotch* (where this was such a useful and cultured column I would start a competition for the most likely predicament in which we might find Angus MacVicar for his inimitable fourth volume. I strongly favour *100 Per Cent Paragon in My Horlicks*).

He goes on: "(Some students) talk interminably about pop art and pop culture, and in the back seats of the stalls and experiment with puns and 'pop'. But at the end of the first year they fall their exams. Grants and bursaries are taken away from them. They are miserable and lonely and hate themselves. I know. In spite of my advantages I went through it."

Basically, *Heather in My Ears* (subtitled *More Confessions of a Minister's Son*) tells how Angus MacVicar leaves the security of a childhood manse for university, is tempted by the demon chocolates, digestive, feces, ruin, but goes on (after surviving from a unique form of amoebic dysentery for which his own name is apparently synonymous locally: viz—"a touch of the Angus MacVicar") to write a Scottish family television series called *The Glens* and lead an upright life, never passing a royal lifeboat collection box without making some donation.

Unfortunately this will not be possible without "application" to the editorial collective. But this does not matter since to convey your every fourth word and you do not have to apply to anyone to do that.

"We argue that... non-reproductive transformations... delimited this site in its negativity... pre-

given categories (as opposed, of course, to post-given categories, which are not the same at all... I do not think anyone will claim Francis Bacon wrote that.

The appointment of 42-year-old John Griener to the chair of accountancy at Dunelm University confuses an unusual family double. His twin brother Peter, a professor of business strategy at the City University business school, however, their routes could not have been more different. Peter went to grammar school, *Balliol* and LSE and, after a period of unemployment, followed a conventional academic career. John, by contrast, failed his 11-plus, left school at 15 and gained his GCEs while working as a clerk at the London Electricity Board. All his academic qualifications were acquired part time but he gained his professorship only three years after his brother.

If the attendances at the opening night is anything to go by, then the club's members are, by and large, those graduates who have decided that the status quo is where they want their villa built. Trivia. All, for instance, is probably not a member.

The club's handbook is very like that of a swallows' union except that the faces of "This year's exec" are discernibly older and the list of activities makes such concessions to new recruits as "coffee and cognac tasting in Hammonds".

The exhibition upstairs showed the club's history from its 1947 beginnings. On the walls were faded pictures of house parties of that era at which people dressed as rabbits and sun gods and still managed to look as if they had a collar and tie on. Another spite swap caught love's young dream on heels coyly pecking the sort of man who probably plays tennis well.

It is comforting to think that, despite all the cynicism in the world, the DES makes a spirited defence of higher education and the "pull" of demand for its products, as the basic forces shaping the size of systems of post-secondary education in most modern societies.

Fun for graduates

"Ladies and gentlemen. Welcome to the University of Bath. A clean-looking young man with a beard had leapt to his feet with the sort of diabolical enthusiasm normally reserved for the followers of Lord Baden Powell.

The IVC (annual fee: £11) is a social club with 10,000 members and 30 branches all over Britain. It aims to help graduates and others of the same age to overcome social isolation and find intellectual stimulus since they have their own lives to live. The club's headquarters are in London, headquarters are established by volunteers out of a dispiriting Covent Garden warehouse, was opened recently by the IVC president, Lord Briggs, himself a graduate who overcame social isolation and found intellectual stimulus by becoming vice-chancellor of Sussex University.

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Predictions can be merely illusions



Martin Trow

It is in the nature of human beings to want to know the future, and as far as possible to control it. We do not like the unpredictable. We are nervous and anxious. We want to know what the future may bring so that we may prepare ourselves for it, both to take advantage of the opportunities it may offer, and to guard ourselves against its downsides. We want to know what the future may bring so that we may prepare ourselves for it, both to take advantage of the opportunities it may offer, and to guard ourselves against its downsides.

But those figures are less and less relevant, as increasing proportions of students in higher education come from older age groups. We can predict that demand for "continuing education" from older students may grow. That itself is a function of government and university policy, of the state of the economy over the next decade, of unemployment levels, of changes of the occupational structure arising from technological change, and of such cultural changes as the broad movement for the equality of women.

The forces that affect enrolment—economic, political, technological, cultural and demographic—are not themselves single forces, each simply points to a large number of factors which have interactive as well as independent effects. Moreover, they have quite different effects on different kinds of students and institutions.

I attended an educational conference in London a few years ago and heard a minister of state in the DES make a spirited defence of higher education and the "pull" of demand for its products, as the basic forces shaping the size of systems of post-secondary education in most modern societies.

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8.6 million students for the same year—a reduction of 2 million within four years. Both predictions are likely to be wrong. Enrolment in the Fall of 1976 was 11.2 million. But predictions can be wrong within very short times. The Office of Educational Statistics (NCES) as recently as September, 1976, had projected the Fall enrolment for this year at 11.7 million. The actual enrolment was half a million less. Apparently the statisticians did not anticipate the effect of the expiration of educational benefits for over three million Vietnam veterans, and this resulted in a decline of nearly 100,000 students enrolled on GI Bill to about 700,000 in 1976. We may not be able to predict very well or very far into the future, but we are much better at explaining why our predictions were not very good.

They are not very good because there are too many forces involved about which we have little knowledge and less control. We know the numbers in the traditional college—average age cohorts for the next two decades, since most of them have been born and it is that demographic fact on which most of our enrolment projections are based.

But those figures are less and less relevant, as increasing proportions of students in higher education come from older age groups. We can predict that demand for "continuing education" from older students may grow. That itself is a function of government and university policy, of the state of the economy over the next decade, of unemployment levels, of changes of the occupational structure arising from technological change, and of such cultural changes as the broad movement for the equality of women.

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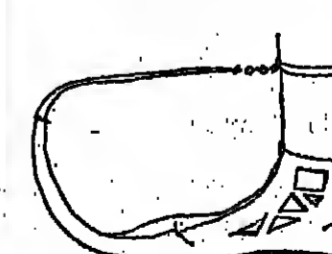
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Trainee teachers look outside

More than 600 north-east teacher-training students have accepted an invitation from Newcastle Polytechnic to consider alternative careers. They will attend a convention organized by the polytechnic next Friday when 54 local employers will advise them on job opportunities.

The polytechnic's Appointments and Careers Advisory Service has mounted the convention in response to the difficulties confronting teachers looking for their first job. Mr Paul Chubb, the assistant director, said: "We hope to impress upon the students that in job terms their qualifications should be viewed along with any other as a licence to hunt for a post in the labour market where employers say they want qualified people."

The convention will underline the fact that there are all young people who have not reached higher educational qualification. I hope that employers who receive applications from them during the coming months will view them as highly suitable employees rather than unfairly labelling them as "failures".



YALES
OLDEST LIVING GRADUATE
1881

Last time (THESE, May 6) I carried a picture of a thirteenth century poultice upside down to check if anyone reads this column or not. This week I carry a correction (about our can you tell?) do have a reader. She is Mrs M. L. Ninn of Cheslum who is clearly something of a wit because all the relevant words of complaint in her letter were themselves upside down. In future issues I hope to carry a photograph of Mrs Ninn.

A scintillating graduate: one of the many photographs in a new book, *Interviews with Master American Photographers* (Penguin Press, £5.95) by James Danziger and Barnaby Conrad III.

Teacher-training reorganization: Judith Judd looks at the south east

Contradictions abound in the proposals for teacher training in the south-east where the Government's criteria have been applied in the roughness and readiness to close some, but not all, small and basically mono-technical institutions. Portsmouth Polytechnic is also threatened, which goes against the national trend.

In the south-east, institutes of higher education, assigned only a limited role elsewhere, will take the lion's share of the places. Some of the decisions about the region must have been clear cut. No one, for instance, would seriously have considered raising Brunel College, grandfathered in diversification in liberal arts courses. In some places, however, colleges have chosen to thank for their fate.

Portsmouth Polytechnic, which merged with the city's College of Education, felt secure with the national pendulum swinging in favour of polytechnic departments. But both the Church of England and the Roman Catholic Church have decided to keep their colleges in Hampshire, and Portsmouth is now fighting for its teacher education.

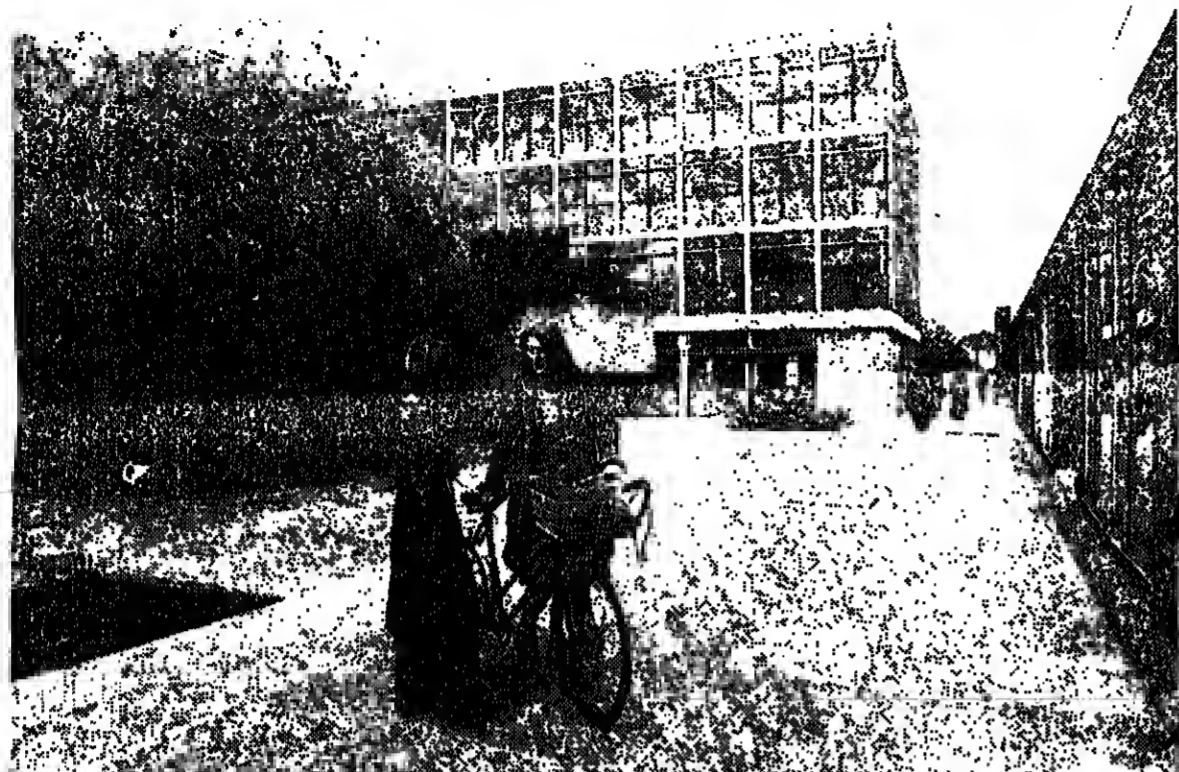
If it does, Hampshire, the second largest local authority in the country, will have no maintained college of its own. The polytechnic says that it is one of the few southern institutions outside London which give students experience in urban schools. The faculty of education is strong in both mathematics and science since Portsmouth was a wing science college.

The polytechnic employs demographic arguments to back up its case. In contrast with the overall decline, population in the south-east, and especially South Hampshire, is expected to go up. Even so, the Southampton area has been given fewer teacher training places than the other major centres of population.

In-service training will be a problem, the polytechnic's supporters suggest, if the faculty of education loses its initial training. The Isle of Wight, whose schools and teachers have close links with the polytechnic, is particularly concerned about the proposal.

Lecturers at the polytechnic are arguing for more places for the south-east but they are also casting their eyes at the institutions around them. Mr Ian Rolls, head of the Faculty of Educational Studies, asked in the polytechnic's newsletter whether the nearest institution—King Alfred's College, Winchester, La Sainte Union in South-

Finger of fate seems to have been partly directed by chance



Portsmouth Polytechnic is now fighting to keep teacher education.

ampshire and the West Sussex Institute of Higher Education—could survive.

He said all must diversify and so will be in competition with the polytechnic for students, mainly in the humanities and social sciences.

The other colleges, however, have their strengths. King Alfred's has pushed its course proposals through the Council for National Academic Awards with an ease which has aroused the envy of other colleges and so for its diversified courses have proved popular. It has just had a DipIIE course validated and has a splendid site in Winchester.

La Sainte Union, which a few years ago looked vulnerable, has developed an interesting arrangement with Southampton College of Technology covering a number of joint courses which take it into the maintained system. There is a flourishing BA in modern languages and European studies and La Sainte Union is the only Catholic college to have a DipIIE. It believes it owes its survival partly to the need to provide for Catholic teacher education in the south.

The West Sussex Institute of Higher Education—the result of a merger between Bognor Regis and Bishop Otter colleges—had its

articles of government approved only shortly before the list was issued and it is too early to see how it will develop. There is clearly going to be a strong competition for students in the area, especially if the number of those gaining two A levels falls to increase considerably.

East Sussex presents a different picture from that in Hampshire. It is proposed that the county's institute of higher education should close and that teacher training should be concentrated in Brighton Polytechnic. Small at the East Sussex Institute of Higher Education, which officially opened just four months before its closure was threatened, are understandably bitter.

The thinking behind the proposal must be that East Sussex cannot sustain two teacher training units and the polytechnic has won the fight. It is proposed, however, that physical education courses of the former Chelsea College should be transferred to Brighton Polytechnic, 25 miles away. This is one of the most extraordinary schemes on the list. Staff say that the fine facilities at East Sussex are not transportable and that the journey to Brighton is a difficult one, especially in the summer. A local authority and college working party is looking at the possibility of transferring some of the diversified courses to the polytechnic.

Nottingham College in Kent is omezed at the lengths in which the DES is prepared to go to save Chelston. Nottingham is also a physical education college and the only remaining maintained college in Kent. It is the only specialist college earmarked for closure. Mr Gordon Carl, a lecturer, says that no other physical education college in the country has achieved such a high level of accreditation. An MA in movement studies will begin the autumn. He says that in many of the general colleges of education scheduled to remain the physical education facilities are completely inadequate compared with those at Nottingham.

The London and Home Counties Regional Advisory Council is concerned that three universities—Kent, Hampshire and Buckinghamshire—will not have a maintained college. In-service training, especially, may suffer and provision will have to be made to cover the gaps in the best way possible.

Indeed, Buckinghamshire will be without any college at all, presumably on the grounds that it is unnecessary from elsewhere. Milton Keynes

Proposals

South-east: Initial teacher training should cease. Buckinghamshire Higher Education. Milton Keynes College. Colchester Institute of Higher Education. Nonington College. Portsmouth Polytechnic. The Crawley outpost of the Sussex Institute of Higher Education.

East Sussex College of Higher Education, except for the provision at the former Chelsea College for physical education, which should be continued. Brighton Polytechnic. Provision at Christ Church, Canterbury, should continue with a reduced provision of 50 places.

If the Government proposals are carried out the number of places in the south-east will be: Bedford College of Higher Education. Brighton Polytechnic (including Chelton PE). Bulmershe College of Higher Education. Chelton Institute of Higher Education. Christ Church, Canterbury. Herfordshire College of Higher Education. King Alfred's, Winchester. La Sainte Union. Oxford Polytechnic. Westminster. West Sussex Institute of Higher Education.

College is a small, mainly technical, college but it has a BA degree run jointly with Open University. The university has made its own plea for the college's survival as part of a higher educational provision for a growing population of the town. The college moved into new £7,500,000 building only 11 months ago.

If the proposal to close the Buckinghamshire college is accepted, inter-collegiate regional experiment will end. Buckinghamshire College of Higher Education is the result of a merger between High Wycombe College of Art and Technology and Reading Park College of Education. Both have worked well with teacher training and multi-racial education.

On the whole the DES has looked favourably at colleges which have made an attempt to create further and higher educational opportunities offered by reorganization.

No way up for the crowd at the top of the ladder

Peter Wilby looks at prospects for promotion in the third in our series on academic career prospects

In 1973-74, Birmingham University promoted 34 people to senior lecturer/reader level, within the University Grants Committee's 40 per cent quota for senior posts. Over the last two academic years Birmingham has promoted nobody at all within the quota.

What does this mean for the end of expansion, combined with financial cuts, has hit promotion prospects in higher education. The academics recruited during the great expansion period of the 1960s are now in their late 30s and at the top of the lecturer salary scale. (Forty per cent of the university teaching profession is aged between 30 and 39.)

And over the past decade, the average age of promotion to senior lecturer/reader has been 39. Now, the age is creeping up and it has been calculated that, even assuming a 2 per cent annual growth rate, it will rise to 43 by the mid-1980s.

Laurie Supper, general secretary of the Association of University Teachers, believes promotion will become an increasingly urgent issue over the next few years. The association's main concern now is

to remove the UGC's 40 per cent quota on senior staff. About 37 per cent of university academics are now on senior scales and, if this proportion were raised to 40 per cent, existing promotion prospects could be maintained.

The association is also concerned about the procedures for promotion. In recent years, many universities have introduced new rules allowing lecturers to put their own names forward for promotion, instead of leaving nomination entirely in heads of departments. The AUT believes this system should be extended to all universities.

But the question still remains of how a particular individual is judged to merit promotion. The most comprehensive research information comes from a study of *The Academic Labour Market* by Garth Williams, Tessa Blackstone and David Metcalf, published in 1974 and based on a 1970 survey. As expected, they found that the most reliable guide to an academic being in either of the senior grades (senior lecturer/reader and professor) was age and experience.

But what of other attributes? The possession of a first class honours degree almost doubled the chances of becoming a professor. It had no effect on the chances of becoming a senior lecturer. Again, a PhD substantially increased the chances of a chair, but made little difference to the prospects of a senior lectureship. An Oxbridge degree increased the chances of a professorship even more than a PhD, but again, without much effect on the aspiring senior lecturer. Almost exactly the same could be said of the London degree.

Whether you wanted to be a professor or a senior lecturer, the same thing you could be, according to this survey, was a woman.

The study is less helpful on the effects of performance within the profession. There was no data that might have measured the effects of teaching or administrative performance. But, for professors, publication emerged as more important than any pre-career attributes. The publication of at least three books increased the chances of a chair by 138 per cent. The chances of a senior lectureship were increased—but by only 37 per cent.

Mobility was also important for professors. Working in more than two universities increased the chances of a chair by 165 per cent but it had no effects on the overall chances of a senior lectureship. An early promotion to a senior lectureship, however, mobility was at a high premium. About a quarter of those who had worked in three or more universities were senior lecturers before 35, compared with three per cent of those who worked in only one or two universities.

Thus, the man who becomes a senior lecturer early is rather like a professor. In fact, he is probably on his way to a chair. The man who becomes a senior lecturer late in his career, however, is probably on the same age. Even for academics in their early 40s, pre-career qualifications, mobility and publication record, taken together, accounted for less than one third of the variance in promotion outcomes.

This suggests that teaching, reputation and administrative contributions may play a more significant part in promotion to senior lecturer than is sometimes thought. While professors are frequently appointed from outside a particular university, senior lecturers and readers are almost always appointed from within. The theory is that the remainder rewards outstanding research and scholarship while the senior lecturership takes a wider range of talents into account.

But the suspicion persists that the main measure of merit for promotion to senior lecturer is research and that it is a pretty crude measure of that. It is widely thought that senior lecturers are learned journals or a better passport to success than a single, well-considered piece of research. In the labour market study, 41 per cent of the academics questioned agreed that promotion depended too much on published work.

In most universities, the published criteria for promotion to senior lecturer remain vague. Southampton, for example, lists four points: outstanding qualities as a teacher and tutor; distinction in research and scholarship; outstanding qualities of a supervisor of students for higher degrees; contribution to the general life and work of the university and department.

Brunel University, on the other hand, is more precise. Of the three main academic activities—teaching, research and administration—Brunel expects either outstanding performance in one and average performance in the other two or outstanding performance in two and indifferent performance in the other. The National Association of Teachers in Further and Higher Education has negotiated detailed points scheme. In one instance, teaching and research are each scaled from one point (very low effort) to five points (enthusiastic). Administrative and other duties are also scaled from no points (negligible duties) to three points (major contribution). A prime feele case for promotion is established if a lecturer gets eight out of the maximum 15 points. Thus, satisfactory teaching, satisfactory research and considerable administrative duties would constitute a case. So would enthusiastic research, low teaching effort, and negligible administrative duties.

Regardless of what criteria a university adopts, promotion chances for the individual must depend very largely on luck. In most universities, a vacancy at senior lecturer/reader level goes into a university pool. A department does not have an automatic entitlement to replace a retirement or resignation. In theory, the sole criterion is individual merit. In practice, much



depends on the head of department's bargaining power. If the French department, say, has had no promotions for several years, then French will probably get the vacant senior lectureship if the head of department grumbles about it often enough.

However, the University of East Anglia has a minimum establishment for each school or faculty, and only a small proportion of the senior posts in a university pool. Brunel has somewhat formalized its procedures by calculating the "promotion potential" in each department, based on age composition. The calculation assumes, for example, that half the lecturers in their early 40s should be in senior posts and 70 per cent of the lecturers who have passed the age of 50 should be promoted. So, a department of 20, with half the lecturers in their early 40s and the other half over 50, would have a "potential" of 12 senior posts. This formula is used as a guideline.

University promotions are simplicity itself compared to the tangled and complex system that rules in polytechnics and further education colleges. Work in this sector is divided into four categories (see table). Since most colleges will have a mix of work from at least two, and probably three, categories, the formulae are used to calculate a college's overall entitlement to senior posts.

The precise percentage of posts a college gets, within the permitted range, depends on the local education authority. In the past, most have chosen the mean point of the range. But the financial squeeze has persuaded many to cut establishments to the minimum. In 1975, about 30 authorities cut the number of senior posts in their colleges and, in Surrey, this action is still the subject of a dispute that may go to arbitration.

A local education authority also has the right to decide precisely how it calculates the amount of work done in a particular category. Does it calculate according to the staff teaching hours? Or student hours? How does it calculate part-time work? The National Association of Teachers in Further and Higher Education has negotiated detailed points scheme. In one instance, teaching and research are each scaled from one point (very low effort) to five points (enthusiastic). Administrative and other duties are also scaled from no points (negligible duties) to three points (major contribution). A prime feele case for promotion is established if a lecturer gets eight out of the maximum 15 points. Thus, satisfactory teaching, satisfactory research and considerable administrative duties would constitute a case. So would enthusiastic research, low teaching effort, and negligible administrative duties.

Within a college, there is nothing to prevent a particular department getting the whole institution's senior lecturer entitlement. (The only exception to this rule is that certain departments may have a minimum entitlement to one or two senior lecturers.)

The procedures and criteria for promotions are just as vague and variable as to the universities. There is not even a general pattern as to whether posts are filled by internal or external candidates. Although the polytechnics are said to lean to internal promotion, while the FE colleges generally prefer external competition.

The further education sector is more hierarchical than the university. Above the basic grading system, there are heads of departments, assistant directors and deans of faculties. Together with the principal lecturers, these provide the polytechnics with a proportion of senior posts that is at least as good as the universities.

Principal lecturers in polytechnics and senior lecturers and grade 2 lecturers in further education colleges are generally expected to take on extra administrative duties. In the further education sector, for example, the grade 2 lecturer may be a course tutor or a safety officer or a supervisor of O and A level entries.

The further education colleges are suffering the same problems of promotion blockages as the universities. At the end of March last year, of the 24,517 teachers on the lecture grade 1 scale in maintained colleges, 11,435 were on the top incremental point. But the Houghton Committee, when it reported two years ago, presented any similar launching of the top of the scale in the polytechnics. It introduced automatic transfer arrangements from lecturer grade 2 to senior lecturer, so that there is now, in effect, a single scale with an efficiency bar.

The trouble is that there is rarely a need to divide the line between polytechnics and further education colleges. A further education college may well be doing the majority of its work in the bottom two categories, but still carries a substantial amount of diploma work above Ordinary National Certificate level.

So a senior lecturer in the lower categories, whose promotion is a rare mark of distinction and whose duties may include those of a deputy head of department, may be working alongside a senior lecturer in a higher category whose promotion is simply the result of automatic transfer from the basic scale.

It is hard to see any solution to the problem so long as the Burnham Further Education scales cover such a wide range. On the one hand, there are the polytechnics, who are competing in the same labour market as the universities. On the other, there are the local further education colleges, concentrating on O and A-level work, who are in the same market as the schools.

Patricia Santinelli at Loughborough University's Centre for Extension Studies

10 years of forging ties with industry and services

Amid much hue and cry from both universities and industry about better co-operation, it is refreshing to find that the Centre for Extension Studies at Loughborough University has for nearly 10 years been quietly and successfully establishing strong links with industry, and the public services.

The main function has been to meet the changing training and educational needs of all sectors through a programme of short experience courses. "We are fulfilling a need which has been established as a result of continuous communication with industry and the public services about what sort of subjects their management and employees need more information on", Dr R. L. Santinelli, director of the centre and pro-vice-chancellor said.

He added that Loughborough had a strong belief in post-experience education and that other universities ought to take a more positive interest in continuing education, which too often was the last priority on their list. They should

also improve their image and go out to industry and other organizations much more.

"This is what the centre does and why it is successful", he said. "Post-experience courses are sometimes ill defined. We aim to provide people with what they really want to learn to improve their jobs. We plan our courses according to the problems they encounter in their work."

Originally the centre's first job was to run the university's summer programme which was designed to attract families to spend one or two weeks taking either vocational or general courses, while their children were looked after.

Out of this grew the realization that there was a demand for specialized courses which the staff had the expertise to deal with. Not only did the summer programme expand and alter but programmes during the spring and autumn holidays were set up and some now run during term time. These programmes not only include courses run by university departments but some for personal training run in cooperation with industry and other organizations.

In 1974-75 the centre ran 25, excluding the summer programme, covering 18 student weeks and taking around 575 students. This represented an increase in student intake but a drop in student weeks from the previous year.

Courses range from very specialized technical subjects to vocational and general interest ones—

the latter taking place only in the summer.

Many are updated and adapted according to changing circumstances and the lecturer is an essential feature of the centre's organization. It is important because each year shows up different trends which reflect current social and economic conditions. The emphasis since 1975 has been very much on the more creative use of resources, environment and control of pollution.

This is reflected in courses such as "Housing" strategy for the 1970s, run in cooperation with the Department of the Environment for senior local government officers and civil servants.

Another change is the recent setting up of courses on company welfare, such as one for existing engineers in the use and control of resources for the aerospace industry. Current technological topics were set up and some now run during term time. These programmes not only include courses run by university departments but some for personal training run in cooperation with industry and other organizations.

As yet one of the courses has led to a possibility that a series of related courses such as industrial resources, conservation and environmental pollution might be offered together to form a diploma.

The establishment, organization and administration of courses is heavily dependent on the background experience of the centre's

academic staff of five, including the director. Most have worked in industry and the public services. The director was chief education officer for a group of manufacturing companies for many years while the assistant director, Mr Harry van Ments, is a trained physicist and psychologist and previously on industrial liaison officer.

Each of the staff looks after a special area; for example the assistant director takes a multi-emailed, social services and technical methods. There are cases, however, where advice and expertise is sought from university departments for a fee in addition to tutors for the courses are drawn from both the university and outside institutions. One advantage for university staff engaged in this work is that they are able to gain an insight in the needs of industry which they can relay back to their students.

The basic requirement for each course is that it should fulfill a need, but financial considerations are taken into account. Recently fees have been increased and demand is being carefully monitored to check whether there is any resulting drop in attendance. The centre does not get a grant, but the university allocates a certain amount to short courses.

The main difference between the university's short courses and those of the centre is that the latter carries out thorough market research. Although the centre is much influenced by its customers, there is

also room for entrepreneurial initiative. Very often a course is set up before any request is made, for example, when a tutor retired from a Department of Health that some development or reorganization is about to take place.

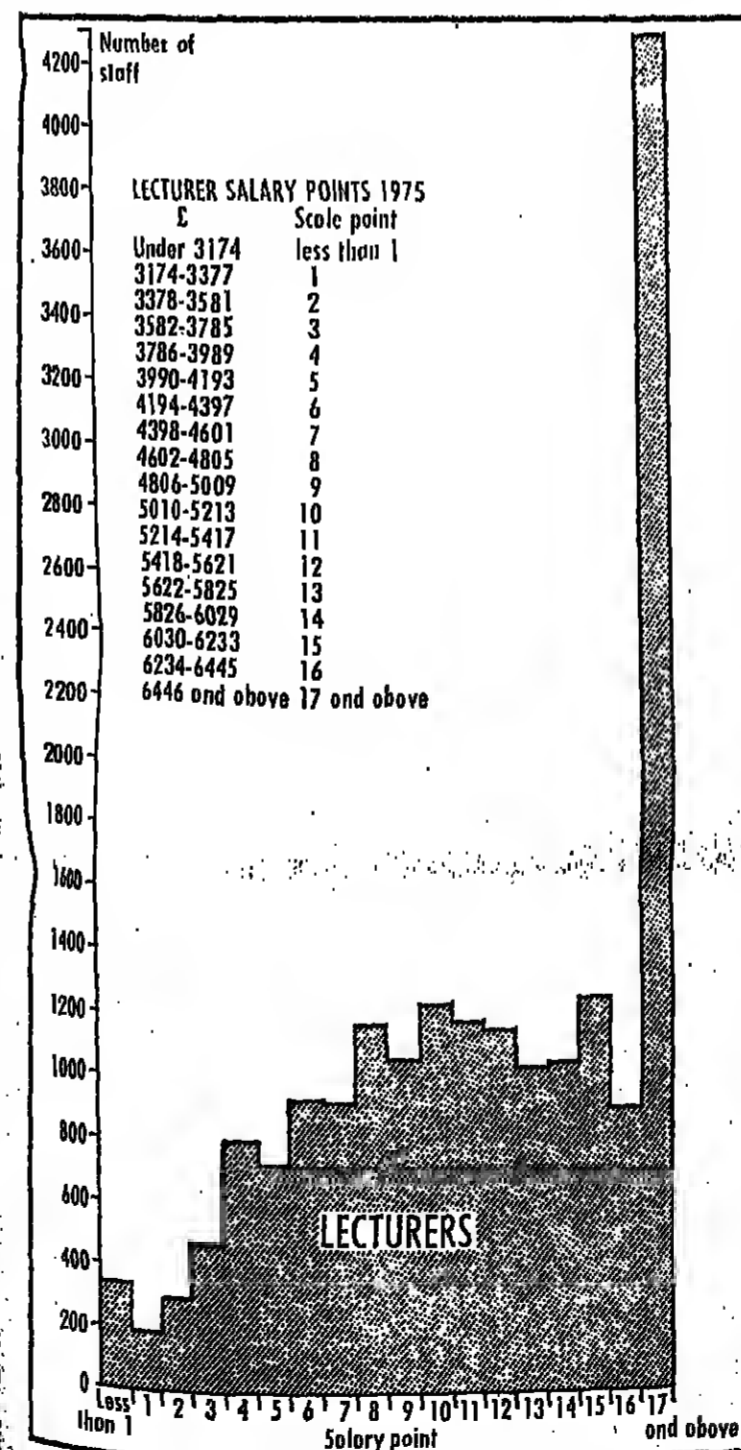
Most participants who are paid for by their companies and institutions have considerable experience which is why the centre does not seek to lecture them, but to change attitudes.

"Tutors act as catalysts", Mr Harry Van Ments, assistant director, said. "Our expertise is more in teaching methods than subjects expertise."

However, drawbacks exist. Mr Van Ments suspected that they might be losing academic mobility by fulfilling practical demands. Indeed there was a concern of jealousy because of the success of the courses. However, to speed this success, expansion will be slow, because of lack of resources in the form of staff and time.

The summer programme, however, is being expanded with Loughborough College of Education which also has a summer school.

Perhaps most interesting is the reverse in social trends—the number of women taking short courses is increasing. The number of women taking short courses is increasing. The number of women taking short courses is increasing.



LECTURER SALARY POINTS 1975	Scale point
Under 3174	less than 1
3174-3377	1
3378-3581	2
3582-3785	3
3786-3989	4
3990-4193	5
4194-4397	6
4398-4601	7
4602-4805	8
4806-5009	9
5010-5213	10
5214-5417	11
5418-5621	12
5622-5825	13
5826-6029	14
6030-6233	15
6234-6445	16
6446 and above	17 and above

LETTERS TO THE EDITOR

AUT and the London University Bill

Sir,—I should like to underline a vital point about the University of London Bill which your article (THES, April 29) may have left in doubt. The purpose of the Bill is to achieve the university's freedom to alter its constitution comparable to that enjoyed by other chartered UK universities. It is this principle of extending the university's autonomy to which Mrs Williams, Secretary of State for Education and Science, "attaches great importance" in her report on the Bill.

"The University of London Bill in its present form will give the university greater flexibility and freedom in proposing amendments in statutes... It would no longer be restricted by the recommendations of the Hilton Young Report."

The University of London Act 1926 currently confines changes in statute to what is in general accordance with the Hilton Young Report of 1926. The Bill now before Parliament would replace these constraints by a series of procedural and other safeguards, the chief of which is that any new statute must be approved by a two-thirds majority of the governing bodies of the university's constituent colleges. What it does not do is to alter the present constitution in any respect.

The Association of University Teachers' (AUT) petition sought, among other things to effect major changes of principle in the university's constitution, notably that the proportion of elected teachers on the senate should be doubled from the present 30.5 per cent to at least 60 per cent and that specific outside bodies should have direct representation on the senate of the present system of appointment of lay members by the Crown and local authorities. Had these proposals been incorporated into the Bill, a new set of limitations would have been imposed on the freedom of the university to decide after consultation with its colleges and teachers, how the federal university should be governed.

No decision has been taken on the final form of statute to be proposed if the Bill becomes law. Consultation is still taking place within the university and there will, no doubt, be further consultation with the AUT about their specific proposals on the draft statutes under the procedure arrangements between the university and the AUT. Moreover, the AUT has been promised that two nominees of its London committee can take part in a review of constituencies for teacher elections to the new senate. This is a question which has closely concerned the AUT and appeared in its Petition.

Academic pensions

Sir,—In his article on education pensions (THES, April 22) Michael Connock states that the problems for someone retiring on the Universities Superannuation Scheme are the same as for a public sector teacher."

Whereas a public sector (polytechnic, further education) teacher can retire at 60 (or 65) and for university teachers at 65. While retirement from a university before 65 may be permitted, this involves loss of benefit. Even though many FE teachers may retire after 60 they are able to provide for what is a full pension (40-60) at 60 by "buying-in" added years of service to give them 40 years pensionable service. This is done by the State. The University of London's scheme is different. It is a pension scheme for teachers under the USS. They buy such added years as will give him 40 years pensionable service by age 65. Contributions to purchase added years are computed to run to age 65. The university teacher cannot provide for 40/80 pension at 60, so can the public sector teacher. Even if the university teacher completes 40 years service at age 62 he must continue to teach until the age 65 to draw full pension (though superannuation contributions would cease for the last three years).

A polytechnic lecturer now transferring to a university is required to join USS, and thus loses the contribution to USS (60 (or 65) pension if he so provides), and also, as a result, the benefits of indexation of pension from that age so ably demonstrated by Mr Connock. BRIAN B. JONES, teaching assistant, York University.

If the new Bill is passed in effect, then under its provisions even when new statutes have been approved by the senate and colleges of the university—the AUT can still make representations to the Privy Council regarding specific statutes. LEONARD CINNA, Public Relations Officer, University of London.

In your excellent report (THES, April 29) of the proceedings in the House of Lords in which the AUT in petition proceedings is endeavouring to have reasoned amendments inserted in the London University Bill, you report that the university opposes the formal representation of the TUC and the CBI on its governing bodies on the grounds that this was felt to be inappropriate for the government of an academic body, the more so since "the entire of the persons appointed was not within the context of the university."

Whatever the merits of the dispute between ourselves and the University of London on the amendments have put forward, I regret very much that in this day and age a university should publicly display such arrogance in putting forward the concept that only the University itself is fit to judge the calibre of those who govern it. One would not mind so much if the lay members of a governing body were elected by the university members as a whole in a free ballot but, putting it in crude terms, what the university is in effect saying is that it should be governed by self-perpetuating oligarchy which cuts country to what is thought desirable in all important institutions in the United Kingdom.

The university also objects to our proposal for consultation before amending statutes or being unreasonable and a limit placed on any other university. This runs contrary to what happens in universities with an enlightened approach where the AUT is called in and consulted on statutes even before they go to the Privy Council for approval, with the further safeguard that AUT headquarters is also consulted on major changes in statutes by the Privy Council.

It is the attitude that seems to have been displayed by one or two groups at the University of London hierarchy that has forced us to formally petition to have safeguards inserted in the Bill itself, where we would prefer to find an amicable solution to the points which are at issue. LAURIE SAPPER, General Secretary, Association of University Teachers, 1, Pembroke Road, London W11 3JL.

Animals in research

Sir,—We read with considerable interest Harold Hillman's article (THES, April 22) on the use of animals in research and teaching. Fund for the Replacement of Animals in Medical Experiments (FRAME) would agree generally with the article, apart from the use of pets in experiments, but would like to comment further on the points which are at issue.

Regarding the risk of marketing non-animal tested commercial products, such as cosmetics and household goods, many of the animal tests presently employed are unreliable and do not guarantee the safety of these products. We feel that the solution to this problem lies in a proper assessment of the reliability and necessity of the existing tests and the development of more precise alternative tests.

We agree that the use of animals in teaching could be considerably reduced by the use of biological models, the use of tissue culture in schools by sponsoring the Xenopus Tissue Culture Kits to sixth form biology classes which allows future generations of biologists and scientists to become familiar with this increasingly important technique.

Dr Hillman mentions that normally only embryonic or cancerous tissues will grow in vitro, but more and more differentiated cell cultures are becoming available. For example, Peter Knox, St George's Hospital Medical School has successfully subcultured differentiated liver and pancreas cells. Yours sincerely, ANDREW ROWAN, Scientific administrator, FRAME.

Open University standards

Sir,—Many excellent points were made in reply to my letter (THES, April 29). But I noticed that no one addressed the main issues.

First, the systematic bias, propaganda and the mission of alternative viewpoints is an objectionable practice. Second, Open University course teams hear an external burden of integrity because of our controlled authority and the huge cost of course production.

Questions of bias and accountability are not easy to handle in practice, but I should still like to know where my colleagues stand on these principles.

MICHAEL MACDONALD-ROSS, Textual Communication Research Group, Institute of Educational Technology, The Open University.

We, a full-time university teacher and research worker—who also do part-time Open University work—would like to comment further on accusations of Marxist bias in Open University courses.

While there may be a Marxist bias in certain Open University materials, this is no different from the situation in other universities. In the Open University, as in other universities, many kinds of bias are found. It is impossible to teach or research from a neutral viewpoint. It is the degree and kind of bias and the Open University's exposed position which has raised objections.

In this situation it is well to remember that part-time tutors are not involved in writing the courses and may introduce students to other viewpoints in their tutorials and in their comments on students' essays.

A more serious criticism of Open University courses is the amount of outdated course material which tutors find themselves constrained to teach. We are currently teaching courses produced in 1972 and

1973, in which the debates and issues have moved very rapidly. In some cases to revolutionized Marxist scholarship.

The way in which the course materials and student assignments deal with these issues now verges on the misleading. A case in point is the assignment on Bernstein in E.262 "Language and Learning" in which the enormous amount of critical material on the code thesis and accompanying interventionist language programmes which has been published in the past five years, is not made available to students.

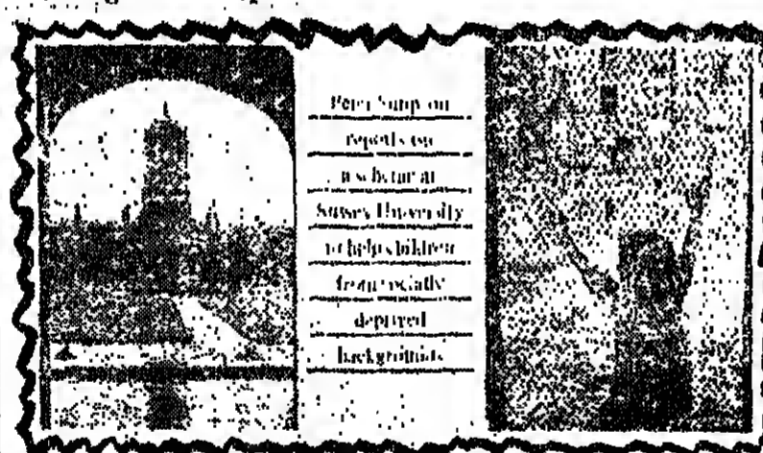
We appreciate the constraints of time and money which affect the Open University, and other universities. But, in our view, the question of bias through obsolescence should be a major consideration in the investigation into courses which the Open University now propose to undertake.

CHRISTINE M. HEWARD, SALLY TOMLINSON, University of Warwick.

I would not wish your readers to suppose that what you reported me as saying at a recent conference of the Ulster Teachers' Union "in an impromptu reply to a question from the floor" (THES, April 22) necessarily represents my position on the academic standards of the Open University. My view, briefly, is that there has not yet been time to test adequately these standards against those of more conventional and long-established universities.

It is clearly impossible to sustain a thesis that standards are lower (or equal or higher) on the evidence at present to hand, and equally impossible to argue seriously the general validity which you quote as attributed to me. Both this university and myself wish the OU well; indeed we help and have always helped the OU in every way we can, and will continue to do so. PETER FROGGATT, Queen's University, Belfast.

Working for the deprived



Sir,—Peter Simpson and his colleagues at Sussex University have devoted time and effort to increasing the numbers of deprived young people entering universities. The April 29. They did not have my full support. I challenge the approach they describe only in the hope that other schemes will be tried out and evaluated so that the most effective one can be widely developed.

The scheme he described relies upon interviewing lower sixth form pupils recommended by teachers and reducing university entrance requirements for selected pupils. Scheme after scheme, the only justification suggested for use of a test such as Raven's Advanced Progressive Matrices in the early secondary school years holds promise as a method of identification. I suspect that without early intervention some of the most promising mathematics pupils will be overlooked and will not continue into the lower sixth.

Of course, with this scheme a lot depends upon the predictive validity of the particular tests (or other means) of identifying them under conditions of intervention about which, to my knowledge, no data exist.

Clearly, these schemes should be investigated as part of the policy-relevant research that such bodies as the Social Science Research Council are urged to promote. C. T. FITZ-GIBBON, Department of Education, Manchester University.

British PhDs

Sir,—I would like to comment on the article (THES, April 29) entitled "Britain has weaker PhD standards" written by Peter F. Smith. To take some of the points raised in the article—made in informal discussion following a paper—and to give them a headline space gives the marks undue emphasis. It is really not about the standards of the wrong issues.

Furthermore, the article implies, quite wrongly, that this country was founded on evidence collected during my survey of the state of pre-session English language in Britain and was central to a discussion of the SELMOU seminar.

Inability to manipulate complex forms of language obviously hinders academic progress and the language of many overseas students when they arrive at university is deficient. Academic staff may be faced with a situation where knowledge of the subject to be taught is in many cases not equalized in may be sound, but lack of articulation on the part of the overseas student may make his thesis does not read well at all.

Language teachers concerned with the problems of overseas students are aware of their frustration and are anxious to avoid the possibility of a situation where high proficiency in language is not underachievement in that subject. JANET PRICE, Newcastle University.

Writing fellowships

Sir,—Why are writers' fellowships at universities only for one year in the first instance or two at most? If a university appoints an excellent writer to the post, the appointment is for life, pensions and so on.

Why do authors and creative people only need a year's support? Towards what end are they being helped? As a writer, I am used to several of my books being used by student teachers. I scribble as a dilettante. The serious writer, however, would have to write for five years reasonably successfully before he could apply for research fellowships. But it is clear that universities like to work with a writer for a year or two and then have a change. All right for the student, but if a writer is at a university which is advertised as a centre for research, it would be a pity if a recognized writer—myself included—would have to give up his job and we should have removal expenses.

Who can take up such an appointment? Universities should appoint writers-in-residence on permanent terms, as with any other appointment, and the Arts Council should make it possible—not least by making that the Library Lending Act has sunk out of sight.

Anything else smacks of a kind of philistine illiteratism—these writing fellowships are better off in the hands of those who make a living. Nothing is true of most writers. DAVID HOLBROOK, Loggrove, Haverhill Road, Stapleford, Cambridge.

Cambridge English

Sir,—I wonder what Cambridge English (THES, April 22) thinks about the prospects for his Cambridge English prospects for Cambridge English? Does he really believe in "centring experience" takes us to the individual points of the particular colour of the "one's value" rather than rest at the centre of the "one's value" which would see us some absurd or abstract definition of the word to be used in an appropriate to a voice whose energy has been dissipated and which we are trying to revive in a narrow sense of duty to criticize commitment?

My quarrel with Colin McCabe is that he cannot use language without listening to that moaning, rigid categorization show that he is not so listened to. RICHARD GILL, Wyggeston Boys' Sixth Form College, Leicester.

Let's start by raising the standard of teachers

Richard Layard puts forward nine proposals for improving the quality of teacher education

Since the publication of the James Report, the quantity crisis in teaching has virtually ended. This at last provides an opportunity to improve quality; yet so far little has been done, and although there is now, of course, no money, many improvements could be made with little expense.

First, let us take the area of initial training. To learn clinical medicine the student goes in a teaching hospital and is apprenticed to a practising doctor, who is responsible for teaching the student. And so it is with every practical skill—except teaching. Those responsible for teaching student teachers are the staffs of the colleges and departments of education, not practising teachers. The staffs of the schools where teaching practice is done have no formal responsibility at all, and are often left to doing the colleges and departments a favour.

There have been minor improvements since the James Committee proposed that such schools should designate one senior teacher as responsible for all students and probationer teachers. But what a feeble arrangement this is: in a secondary school one teacher is meant to ensure that perhaps a dozen young people learn to teach mathematics, English, history, music and so on. The idea is ridiculous, for the only person who can teach one how

to teach mathematics is a mathematician. And if one wants him to be responsible for the entire range of subjects, he should be formally responsible for the entire range of subjects, and asking for nothing to be done.

If we start from this premise, it becomes clear that large numbers of practising teachers will have to be recruited to the craft aspect of teacher education. This can be done in either of two ways: or, most simply, by a mixture of the two.

First approach is for most schools to have a handful of teacher-trainers on their staff—the medical analogy to this would be that most hospitals had one or two teaching departments. The other approach is to have "teaching schools" in which all the permanent teachers in the school are teacher-trainers, but much of the teaching is done by students. Such teaching schools must, of course, have a normal level of pupils to make most American lab schools and many of them could usefully be in deprived areas.

The main advantage of the teaching school is the chance it offers in select and develop a really talented group of teacher-trainers who would stimulate each other and inspire budding teachers with a high morale, based on real teaching achievement. In addition, the permanent staff of colleges and departments could interact more fruitfully with practising teachers if they were to be in a smaller number of schools.

In this way the important theoretical work of the colleges could develop in closer relation to teaching realities. The students, too, would find it much more fruitful to start teaching where they had

some chance of coping with the difficulties of the job; one of the worst features of existing arrangements is that young teachers are expected to conquer Everest before trying out Snowdon.

The main argument against the idea is the usual gnatcatcher problem, namely that children in such schools would be taught far, perhaps half their time by transient students. This is a real problem at the primary level. But at the secondary level, where continuity is less crucial, the advantages to children from being in high quality, high morale institutions would surely outweigh the disadvantages of student turnover. What is needed now is a bold experiment with one of two teaching schools.

So, as a first step in the right direction, I make two suggestions. Proposal 1. Any head of department for other teachers who is directly responsible for student teachers during their teaching practice should have a formal position of appointment to the staff of the relevant college or department (as well as his full-time school appointment), and receive a small honorarium in addition to his regular pay. Proposal 2. There should be one or more experiments with "teaching schools", using one or more new secondary schools currently in the pipeline. This will require voluntary collaboration between an I.A.A. and a college or department, as well as encouragement and support from the Department of Education and Science.

We now turn to the probationary period, a crucial period in a teacher's life. We all know teachers who went under at this point and have never really surfaced since. Such tragedies (for the teacher and his pupils) result largely from a sys-

tem in which people are thrown in the deep end, rather than being helped gradually to tackle problems of increasing difficulty.

Typically, teachers start off in schools that are more difficult than the average, with classes that are more difficult than the average. And at the same time, they are devising a totally new set of lesson notes (not surprisingly some decide never again to try to make lesson notes).

Proposal 3. Probationer teachers should teach only a fraction (perhaps three quarters) of the normal timetable. Proposal 4. Probationer teachers should teach only an average share of the more difficult classes in their school (possibly with right of appeal to inspectors).

Proposal 5. Probationers should not be appointed to schools of exceptional difficulty. (Of course this will benefit these schools since in present conditions it should be possible to staff them with more experienced teachers.)

As regards in-service training, this is both a right and a duty for teachers. Apart from ensuring adequate provision of courses—especially in the basic matters of teaching technique and subject content—we have to ensure that the less competent teachers attend. Proposal 6. Every teacher should be required to take in-service training for the equivalent of at least 30 days (or equivalent part-days) in every five years.

There is, however, a special problem with mathematics. A major cultural problem in Britain is the relatively low prestige attaching to quantitative skills, at all levels of quality. This can only be remedied quickly by in-service training. In secondary schools, mathe-

matics is, more than any subject, taught by people with no formal qualifications. Some of them do it well, but the matter is so serious that I make the following proposals.

Proposal 7. A date should be set (perhaps 1984?). After that date it would not be possible to teach mathematics in a secondary school without a Certificate of Proficiency in Mathematics Teaching (Second-year), for which the inspectors would be responsible.

Courses would be available to enable people to reach the desired standard. For primary schools a later date should be set; after that, no one should be able to do general teaching in primary schools without a similar certificate.

Proposal 8. Mathematics O level should become a requirement for entry to colleges of education (except perhaps for physical education and art teaching).

Finally, I hesitantly raise the other major problem, that of senior teachers. In teaching, like other professions, a minority of the leaders of the profession are incompetent or lazy, and in consequence the children suffer. Hence: Proposal 9. All appointments to heads of department posts and above should be for 10 years in the first instance. If the appointment is not renewed, the teacher's right to senior teaching position should be fully protected at present when schools are closed.

If teacher quality is the key to educational reform it might be better to try improving this, than to lay down too much about the standards for pupils. Start with the teachers. The author is head of the centre for the economics of education at London School of Economics.

When committed theatre moves from agitprop to true politics

Bernard Crick reviews the RSC's production of David Edgar's *Destiny* which opened at the Aldwych Theatre last week

David Edgar is a man of our times. He edited the student paper at Manchester University and became a reporter in Bradford where the students performed his first play, the *Notional Interset* and took it up to the Edinburgh Festival. It was, we are told in an enthusiastic programme-note by Anthony Everitt, the drama critic of the *Birmingham Post*, "a chronicle history of the first year of the Conservative Government" of 1970, and it led to a formation of a small fringe company called *The General Will* (presumably, à la Rousseau, a few of the purified and the elect speaking to the corrupted masses). And he has written many another significant piece.

So, I went fearing the worst, more for duty than for art and/or pleasure. My sense of duty is peculiar. I believe that an occasional socialist has to stand up and say that much committed theatre is rubbish, especially from those playwrights who stick to their guns but do not know what it is, like some students who can spell it, or who simply follow some absurd or abstract definition of the word to be used in an appropriate to a voice whose energy has been dissipated and which we are trying to revive in a narrow sense of duty to criticize commitment?

My quarrel with Colin McCabe is that he cannot use language without listening to that moaning, rigid categorization show that he is not so listened to. RICHARD GILL, Wyggeston Boys' Sixth Form College, Leicester.

So much good drama already contains good politics—on hesitates to mention Shakespeare and Shaw and Shaw. Really mean a good understanding of politics. For politics is concerned, indeed, with dilemmas and alternatives, with the

clash of values and interests, and with uncertainties as to which is which. Nothing is more dramatic than politics except good drama itself. The theatricality of politics is sometimes appreciated, but very rarely "politically" planned. The producers mistake commitment for politics or the end of an argument for the process itself.

How boring it is when the correct solution is prejudged and rammed down our throats, eyes and oortholes. Politics is concerned with conflict, indeed, but not of a single kind or with a single or final solution. May I say—to fish for support from Grassi men at least—that both politics and drama are dialectical processes? Brecht at his best sees this—as in *Galileo*—but at his worst, say in *The Days of the Canine*, it is cardboard-cutout claptrap.

The idea that theatre in our time is a good medium for agitprop to the masses, is a sad joke. The good old days of Unity Theatre! What a self-deception was there. In fact, it was a device for consulting the intellectuals in the CP, an odd kind of treat for the long suffering rank-and-file, and generally a preaching to the already converted. Perhaps it worked best the other way round, introducing the "other members" to the arts.

However, though I came prepared to mock, I stayed to pray. My knees ache a little. It was a little too long. No socialist play should have two interludes. And right at the very end he became terribly explicit, strident and wrong. I have often imagined but never hoped to see: a strong and committed left-winger able to understand and to dramatize empathetically the psychology and doctrine of fascism; indeed, his working-class as well as his own.

Borkenau, Kossler, Orwell and Silons argued the need to know the other side's feelings and case as well as one's own—advice seldom taken today. David Edgar, however, has produced a play about, on another about, of course, the retreat from Empire and the risks of fascism today, almost wholly in terms of the nasties themselves. His clinical empathy is extraordinary. He does something so rare in the



Michael Pennington as Major Rolfe, Ian McDiarmid as Turner, and David Lyon as Colonel Chandler.

political theatre: he sends out the audience informed, disturbed and thinking, not full of a surrogate glow of an evening's political passion.

Types never seen on the stage in three dimensions before and never needed their own kind of lighting (Ray Laidlaw) and the actors reveal in their rich, difficult and melodious voices, and do the author proud. A backcloth of a military painting of a trooper cutting down a Sikh and baroque court music as scenes change, and the use of both as brutality and the civilized pretensions of empire. We are forced to face the awful plausibility of racial prejudice, even of racism. A remarkable talent is revealed.

His powers of empathy are so great that entire people, expecting the usual earnest sermon, actually took it for an apology for English fascism. So his herald, Antony Everitt, explains all in the programme notes invoking what Orwell called "the three secretaries": "The simplest way of explaining what Edgar is trying to do is by analogy with Marxist dialectic. The thesis is bourgeois drama, which describes human behaviour but does not explain it. The antithesis is agitprop drama which portrays men and women as being wholly determined by social and economic conditions. Edgar is now attempting a synthesis which explores the dynamic between

individual motives and social conditions. That is crude! And to the non-Marxist, the synthesis is so sensible and familiar that one wonders if the prior journey was necessary. But it is right, in a way, and the synthesis is brilliant.

Only right at the end does the author falter. He shows the Nation Forward leaders being embraced by big business to help discipline the unions. They would be "wasting their money." A better analogy between the fall of Weimar and contemporary Britain is good for dramatic irony, but is awful poor history or sociology. Here is the end with topical documentary theatre.

Edgar ends by his leading fascist quoting Hitler: "The only thing that could have stopped our movement was if our adversaries had understood our principles and smashed our movement with the utmost brutality." But things do not go wrong because of bad principles alone; a Marxist should know that. And only the most immature student politician can believe that British fascists today would not gain, rather than lose, by their adversaries trying to follow Hitler's advice. The author is professor of politics at Birkbeck College, London.



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New study charter for campus handicapped

After years of debate a comprehensive regulation banning discrimination against millions of handicapped people in the United States has been signed by Mr Joseph Califano, Secretary of Health, Education and Welfare. It will become law at the end of this month.

Groups representing the handicapped were triumphant at their victory in getting a long-delayed section of the 1973 Rehabilitation Act finally implemented. During the past month they have held a series of demonstrations and sit-ins to protest against the delay.

Universities were not so enthusiastic. It has been estimated that it will cost them around \$2,400m to make all the architectural modifications needed to ensure proper access to the physically handicapped.

The section of the Act affects all institutions that receive federal government funds, including schools, colleges and health centres, and deals with the way they employ, enrol and provide services to the handicapped.

The most controversial point is the definition of "handicapped". Dr David Macklowe, the former HRW Secretary in the Ford Administration, refused to sign the regulation because of this. Some universities were afraid they would be forced to hire "quotas of junkies and drunks".

Mr Griffin Bell, the Attorney General, has now made it clear that it will be illegal for universities and colleges to discriminate against these people. But in a 17-page opinion he added:

"Our conclusion . . . does not mean that such a person must be hired or permitted to participate in a federally assisted programme if the manifestations of his condition prevent him from effectively performing the job in question or from participating adequately in the programme."

Long-distance medical link

A long-distance link-up between the medical school at Monash University of Newfoundland and four hospitals in remote parts of the province has just started by means of a communications satellite.

The Telemedline Project, as it is known, will last 12 weeks, and will allow doctors in the four hospitals to follow in-service courses at the university.

There will be two-way audio-visual communication so that participants at all the sites will be able to talk to each other. Between three and five hours' broadcasting time will be available every other day.

Stanford raises record sum

Stanford University has completed the largest successful fundraising campaign of any American university. In five years it has raised more than \$300m.

The campaign began in 1972, and managed to stay on schedule. By last week more than 54,000 donors had made pledges or gifts, including one anonymous donation of \$15m. The money has been used to increase the number of endowed chairs from 49 to 125, and to provide \$35m for student aid and more than \$50m for buildings. A new main library now being built will also receive \$16m in support.

Individuals contributed \$75m, foundations \$91m and business and industry \$35m.

Stanford's campaign is one of the most ambitious ever launched. The largest in the drive for \$370m at Yale University, begun in 1974. This, however, is well behind target, having only received \$158m so far.

In the last of three articles on private colleges, our correspondent looks at their future prospects

Survival—of the fittest

America's elite private universities are so good—the best in the world according to Professor J. K. Galbraith—that it is assumed they have a bright and secure future. The assumption is probably correct; but it is one that invites a complacency that would handicap the universities themselves.

Private education throughout America is under considerable financial pressure. The fact that several elite universities have closed in recent years is a tribute to their very considerable efforts to improve their management, cut out waste, build up their endowments and tap new sources of income. It does not mean the threat of bankruptcy is unreal or that inflation has ceased to gnaw at the foundations of the private system.

Even the great private institutions cannot ignore a disturbing trend: the private sector has a steadily shrinking share of the market. In 1950 it accounted for about 50 per cent of all students receiving higher education. Now it accounts for only 20 per cent.

Moreover, as the decline in the birth rate begins to be felt at college level, the competition for students grows more intense. It is very difficult for a state university—a source of strength and pride to a state and its legislators—to shrink in numbers and significance or to close down altogether. States will probably allow all kinds of concessions to the public sector to ensure that they do not come off worse in a battle with the private sector for enrolments.

In fact such a fight to the death is unlikely, as the demand for adult and recurrent education will continue to grow at the college-graduate level. Both public and private universities will be adept to the new market.

But here again the private sector may suffer: many of its colleges

are too small to be able to make the changes and to offer the wide range of courses the adult market would prefer. And public universities have already begun to increase their intake of older students.

Despite this, however, few people see an immediate end to private higher education. Demand seems assured for a number of reasons. The first is that success breeds success. America's top private universities have produced and do still harbour many of the world's outstanding scholars. They have built up an enviable reputation for academic rigour, research output and scholarship of the highest order. Postgraduates from all over the world compete to get into the Stanford School of Business, the Yale Law School, the Johns Hopkins Medical School or the University of Chicago School of Economics.

These universities will continue to attract the best teachers and students, which in turn ought to ensure that they remain the intellectual dynamo of America. They will therefore continue to receive large private and government research contracts. The money guarantees the stability of the highest research talents together.

One reason, for example, why the Massachusetts Institute of Technology regularly tops the list of research award recipients is that earlier awards have enabled it to invest heavily in developing a major research programme which has already been established before other universities have begun to get off the ground.

The other main factor that should guarantee a place for private education for a long time is the demand for religious education and colleges with specific religious orientation. Women's colleges have been shown to be very supportive to women, and to produce high academic standards and matriculation.

Public single-sex colleges, however, have recently disappeared, and no women wanting to go high on their own academic merit are being drawn to the few prestigious women's colleges.

Denominational education cannot be publicly provided because of the constitutional separation of church and state. It was said that the demand for religiously-based higher education would fall off quickly but the figures have not borne this out. Indeed, enrolment at denominational secondary schools and colleges has risen fairly sharply in the past two or three years.

The churches themselves seem determined to continue to support higher education. In the Methodist case, for example, some 20 colleges will be left to fund themselves but there are many others that will continue to receive large sums in aid. And America's largest private university, Bryn Mawr, is closely connected to the Moravian Church.

The Catholic universities in America are also generally managed to meet their appeal, both by liberalising their curriculum, and by reaffirming the role of a spiritual role. They have been greatly encouraged by the example of Notre Dame, in Indiana, whose charismatic President, Father Theodore Hesburgh, has regularly visited both the most influential men in the Catholic Church in America and the most influential men in higher education today. The latter, serving presidents of a major university, has for 25 years been Catholic education as a major force in private higher education.

No one expects that all private universities will benefit from the demand for the best. Though the religiously-oriented private colleges may flourish, they are likely to be small liberal arts colleges and a few women's colleges. The best have been shown to be the best.

Carnegie shows government as blacks' main job benefactor

One out of every eight black American men with a degree is employed by the federal government, according to a recently published study. In some fields the importance of government employment to black graduates is even greater: it accounts for one in four black male scientists and computer specialists and one in five engineers and accountants.

The study is one of the very few to be issued by the Carnegie Commission on Higher Education, a commission that produced a shelfful of studies covering every aspect of higher education, and which officially wound up its work in 1973. It has been succeeded by the Carnegie Council for Policy Studies in Higher Education.

This last report, by Professor Richard Freeman of Harvard, found that overall the federal government employs about 5 per cent of all American graduates—but only 3 per cent of all Americans who work.

Professor Freeman said the high proportion of black professionals working for the government was a major factor underlying the substantial gains blacks have made during the past decade in breaking traditional patterns of education.

It was not a new phenomenon for so many blacks to work for the government, he said, because government had been less discriminatory against blacks. But the extent of it was startling.

Industry had also actively recruited black graduates. But blacks with education and experience earned far more in government than in private business, whereas the opposite was true for whites.

Blacks are also well represented in state and local governments, as well as in the armed forces. Overall about 51 per cent of all male graduates were employed by black graduates were employed by state and local governments, as well as in the armed forces. Overall about 51 per cent of all male graduates were employed by black graduates were employed by state and local governments, as well as in the armed forces. Overall about 51 per cent of all male graduates were employed by black graduates were employed by state and local governments, as well as in the armed forces.

Scientists warn against local genetic bans

American scientists have given a warning that any legislation allowing local communities to ban genetic research or setting strict regulations than the national guidelines would set a dangerous precedent.

Members of the National Academy of Sciences said in a resolution that the research limitations of America were a significant national resource and that the different opinions could subject that resource to arbitrary regulations.

"Overly restricting this type of research would severely degrade the capability of biomedical research and limit its contribution to the public welfare. In essence, it would allow a local component of national policy."

The signatories said the National Institute of Health guidelines on the conduct of DNA research were the result of careful deliberation, and should form the basis of a uniform national set of regulations. But the national set of regulations to get up a national regulatory commission to govern this research would have given it research powers of control and signatories said, "represents a wholly new and unfortunate departure."

For those not swayed by these arguments the conference cannot guarantee they will be able to study change in the medical school of their choice.

The conference said that the major priority was to maintain standards and to cut back the spiralling costs that medical studies impose on the community.

One year's clinical study is estimated to cost the community around £1,000 a student. But if costs have rocketed, so also have the number of medical students. From 317 in the winter term 1960-61, they reached 4,584 in 1965-66 and are expected to reach 6,985 for 1975-76. The total capacity of the five medical schools in Switzerland is no more than 1,050 a year.

Dons strike over sack threat

Mr Malachy O'Rourke, a former principal of a lecturer in French at the National University of Ireland, has issued a notice to two academics in what has become a cause célèbre in university circles throughout the Republic.

The dismissal notices followed hard on the heels of a one-day strike organised at St. Patrick's by the Irish Federation of University Teachers (IFUT).

The strike, the first ever at a university institution in the Republic, was called in protest at the sack of two men threatening them with the sack if they did not submit their resignations (THE TIMES, March 18 and May 6).

At the centre of the dispute are Dr J. McGrath, a priest, who is professor of logic at Maynooth, and

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West Germany Student numbers fail to match expectations

Enrolment in West Germany's higher education institutions are not meeting the hopes of the government and the important educational planning and policy-making bodies. Provisional figures just published by the Federal Statistical Office reveal that since 1973 the number of new students has hardly varied from one year to the next.

Combining the figures for the summer and winter semesters there were in 1973 165,000 students newly registered at higher education institutions. The number of first year students in the following year was 168,100 (up 1.8 per cent), in 1975 167,500 (minus 0.4 per cent), and in 1976 168,100 (plus 0.4 per cent).

These statistics are puzzling for they seem to run counter to the development observed up to 1973 and the trend predicted well into the 1980s. According to the most recent forecasts at the Students Conference of the Länder Ministers of Education, for example, the number of school leavers with university or college entrance qualifications is expected to continue to rise from 165,000 in 1975 to 210,000 in 1980 and to 250,000 in 1985.

This is due to the steady increase in the size of the 19 to 21 age group which in turn is the nucleus of the post-war baby bulge. This trend is expected to be reversed only in 1984 onwards. Even then, the number of applicants will not be expected to drop proportionately because a higher percentage

EEC go-ahead for lawyers

The 125,000 lawyers in the EEC will be able to provide their services in any of the member states as from March 22, 1979. A directive to this effect has now been passed by the Council of Ministers.

The right to provide services differs from the right of establishment which, for instance, enables doctors as from December last year to set up a practice anywhere in the Community. The latter entails mutual recognition of qualifications and diplomas which, as yet, remains a distant objective for the legal profession.

The present directive is based on the mutual recognition of the status of lawyer as defined in each member state. In Britain's case this includes advocates, barristers and solicitors.

A lawyer providing services is exempt, in the host member state, from any condition requiring residence or registration with a local professional organization. But in exercising the right to represent a client before the courts or public authorities, he must practise under the same conditions as lawyers established in that state. Thus he is subject to dual code of professional conduct.

As far as Britain is concerned, the directive recognizes what in practice has been happening for a long time. Its advantage, however, is to enable a solicitor or barrister to advise or represent his client without having to apply for registration in the host country or to be faced with other procedural difficulties.

Switzerland Medical schools 'saturated'

Medical schools at Zurich, Bern, Basel, Lausanne and Geneva have reached saturation point, according to the Swiss University Conference, the main coordinating committee for higher education in the federation.

In a last-minute measure to deter further applicants, the conference has sent out a letter to school leavers, pointing out the disadvantages of studying for a medical career: the costs, the difficulty of the examinations and the length of course.

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South Africa Recognition problems may face new Transkei university

The Prime Minister of the Transkei, Chief Kaiser Matamela, has been installed as the new University of Transkei's first chancellor—six months after the country's controversial independence.

The ceremony in Umtata marked the end of the university's status as a college of the University of Port Elizabeth, one of South Africa's black homeland universities. The multi-racial university has 300 students enrolled this year, and will award its first degrees in 1979.

In view of the Transkei's independence situation, the university may encounter difficulties in gaining international recognition. The actor, Professor van der Merwe, called on all races to join hands in shaping the university's curriculum.

Meanwhile, while the considering of the future of the University of Fort Hare. Although situated in the Ciskei, the university is controlled from Pretoria by the central government, without Ciskei participation. Chief Jongilang, has attacked South Africa for the lack of representation on the university's council, and indicated that his government might consider "seizing

Denmark 'Red' campus dispute leads to shutdown

The changes are part of government policy to bring Roskilde into line with the rest of higher education in Denmark. This meant ditching many of the radical concepts the centre was founded on in the early 1970s (THE TIMES, February 18, 1977).

Mrs Bjerggaard felt these changes were progressing too slowly and she wanted to assess more slowly introduced obligatory course work were started. Last spring, students refused to sit these examinations and 203 students were initially expelled before being reinstated after nationwide demonstrations.

The increase in intake coincides with a long-term policy spelt out in a draft plan for the centre prepared by the three rector earlier this year. It foresees overall intake increasing to 600 a year, giving a total of 2,500 students by 1984. Each of the three faculties will be roughly the same size with between 60 and 80 teachers in each, thus ending the dominance of the social sciences. At present there are 62 social science teachers compared with only 47 in the humanities and 27 in the natural sciences.

This long-term road away from the social sciences—especially full degree studies—and towards shorter-term vocational oriented technical and applied studies is a radical one and partly explains the widespread support Roskilde students are getting in the current dispute.

Despite this recurrence of disruptions at Roskilde, its future looks more secure than a year ago, when only two votes saved it from closure by Parliament. In the go to the humanities and 100 to the natural sciences. The social sciences fraction by means of redundancy for 10 teachers and the students' action has been strongly supported by staff in the faculty and, to a lesser extent, throughout the centre.

The decision to halt intake follows a failure to agree a new curriculum for the social sciences course. Changes were accepted by the other faculties in discussions with the introduction of direct Ministry rule and superimposition of the right-wing parliamentarianism by Education Minister Mary Bjerregaard at the end of 1975.

Mrs Bjerregaard's low-key policy has been to leave the dispute to the university authorities. With the main bulk of examinations being set under way this week, the pressure for a compromise is increasing and an eventual settlement allowing some students to enter the social sciences this autumn will be a relief.

France Political activism under fire

A new attack against growing political activism inside the education system has been made by Madame Alice Saunier-Seïte, Secretary of State for Higher Education.

Speaking to the middle-of-the-road Fédération Nationale des Syndicats Autonomes de l'Enseignement Supérieur, the Secretary of State placed the blame for this development on the loi d'orientation of 1968.

The law, passed in the weeks of the May uprising, brought about fundamental changes in both teaching and the administrative structure of French universities. It divided the older and often monolithic institutions such as the Sorbonne into smaller groupings, named Units for Education and Research (UER). It also gave them consid-

erable financial and administrative autonomy as well as shifting the emphasis in teaching from lectures to seminars.

Granted that she was speaking to a group of educationists, middle and upper ranking university teachers and one not known for its radical views, the spectacle of a Secretary of State attacking the basic legislation governing the institutions for which she is responsible is hardly less curious.

The speech by the Secretary of State should, however, be seen in the context of a recent meeting between President Giscard d'Estaing and his Ministers at Rembouillet. The two-day conference, called to work out a strategy for the government over the coming year, is seen here as a lead-in to the general elections scheduled for May.

Australia Union backs voting system

Students at tertiary institutions throughout Australia have endorsed the prosector collegiate voting system for the Australian Union of Students despite allegations that the system favoured left-wing radicals.

The final votes showed that 54 campuses voted to retain the system and 19 wanted a change. However, it was significant that the majority in terms of the weighted vote for bigger campuses was much closer—178 to 113.

Sydney University, the University of New South Wales, Monash University and the University of Melbourne were among the reform of the system. Advocates of change said this indicated the general desire

for direct elections in place of the present system of collegiate voting whereby all the delegates from a campus vote as a bloc. The campus with 11 delegates might split six-five on an issue giving the majority all 11 votes in any council matter.

The attendance at the meetings to discuss the voting change was significantly higher in most places than the vote. Support for an anti-government campaign 10 days earlier.

The AUS then called for a total boycott of lectures and organized public rallies. However, student numbers at most institutions were only slightly below normal and the total attendance at the rallies was about 5,000—about 2 per cent of the total AUS membership.



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More teaching companies

The current climate of concern about the interface between industry and education, especially engineering, will ensure a general welcome for the decision by the Science Research Council and Department of Industry to extend the teaching company programme.

The SRC cannot be said to have gone wild with enthusiasm about the idea. It will continue to operate on a trial basis until 1982, and the contribution represents only a tiny proportion of its £140m total budget. Other schemes to improve the postgraduate training of engineers, such as Total Technology and Co-operative Awards in Science and Engineering (CASE), will continue in parallel.

The aim is to get about 20 teaching companies going over the next five years, and there is apparently to be a shortage of applicants for the available places. Indeed there may be more danger that universities and polytechnics eager for a share of the action will pair off with neighbouring firms and submit proposals without thinking carefully and deeply enough about what is involved in a teaching company.

If a significant proportion of the projects founder because one or both sides go in with expectations too high or commitment too low,

relations between industry and academe as a whole will suffer.

On the academic side, university and polytechnic staff will need to get really involved in the management of the company. They will have to devote to meetings and liaison time that they would much prefer to spend on research or teaching. In order to ensure the maximum educational benefit from the scheme—the experience of the five pioneer projects started in 1975/76 indicates that some firms tend to look on the teaching company as a means of obtaining consultancy on the cheap. The academics must ensure that graduate trainees, formally attached to the company are given really worthwhile long-term projects, which can act as a focus for smaller projects by other students, especially undergraduates.

The teaching companies still lack a central coordinating organization to make sure the lessons of individual projects are learnt by all the others, to step in with advice when things go wrong, to help new schemes get off the ground and generally to market the teaching company concept. Only a small body would be needed—perhaps a director and a couple of assistants—but it is important for the SRC and DoI to agree to set it up as soon as possible.

Inexpensive experiment

The idea of teaching schools put forward by Richard Layard (page 21) is worth serious consideration. The schools would have a complete staff of teacher trainers but most of the teaching would be done by students. For the pupils there would be clear advantages. They would be taught by institutions of high quality by enthusiastic teachers, though care would have to be taken to make sure they were not treated as guinea pigs. Another benefit would be that of continuity. Some teachers change their work at secondary level this is of the utmost importance, but such an argument would have less force in a teaching school. Surely an experiment of the sort advocated by Mr Layard should be tried.

Something must be done to lighten up the in-service and induction training of teachers and the pressure put back in the number of those in teacher training offers an ideal opportunity for improvement. A recent Department of Education and Science report on two pilot induction schemes has shown that the allocation of a probationer to a teacher-mentor staff at the whole, successful, few teacher-trainers watched their probationers teaching for any length of time and few were watched by them. It is this kind of problem which could be ironed out in a more highly organized system of in-service and induction than the one which exists at present. The James committee proposal that schools should designate one senior teacher to co-ordinate all probationers is clearly not adequate.

The politics of the Great Debate, the conflict between comprehensive and grammar school, and between progressives and traditionalists, have tended to obscure the real key to improvement in educational standards—better quality teachers. It is possible to go on testing children forever without any noticeable change unless the teaching profession is improved. The present piece-meal induction and in-service training schemes are not equipped for the task. Mrs Williams recognizes these things and has called for more in-service training and better induction schemes. The difficulty has always been money.

The advantage of a teaching school would be that it could be set up at comparatively little expense, the only sort of experiment which has a chance in the present economic climate. The proposal would mean the appointment of practising teachers as assistant staff at colleges and departments of education, a suggestion which the Government is known to be considering as part of the forthcoming Green Paper on education. This will no doubt prove unpopular in some of the threatened and contracting colleges, but it could also prove fruitful.

Women and men at Oxford

It has been the least of the delicate over-conscience at Oxford that the women's colleges, which once provided such an important advance in the extension of educational opportunities for women, should have been among the main opponents to the moves to open men's colleges to women undergraduates.

The objections of the five women's colleges are not unconvincing, however. They know that it has been self-interest on the part of the men's colleges rather than any desire to give women a fairer share of places at Oxford which has sustained them through the long, slow process of statute changing and resolution passing, until co-education was finally accepted by Congregation last month. Undoubtedly certain men's colleges, faced with increasing numbers of women students, realized that they needed women undergraduates if they were to maintain

academic standards and increase their share of first-class honours.

So the women's colleges are quite right to fear that they may lose their best potential students. Their better colleges have more money, more scholarship more venerable buildings, and a wider range of subjects to offer, so it will not be surprising if many women do choose to go to one of the former men's colleges. Nor will it really make any difference whether the process of changing over to co-education is carried out fast or slowly; the result will be the same.

Some of the five colleges will go co-residential as Lady Margaret Hall has already decided to do and others will no doubt choose to remain single-sex institutions. Whichever they decide, it seems a fitting moment to salute them for the role they have played in advancing women's education in the past, and which, in a different way, we hope they will continue to play.

LETTERS TO THE EDITOR

University pay grievance

Sir,—In his article dealing with the present lamentable state of academic salaries (*THE TIMES*, May 15), Mr David Walker asked "How justified is a pay grievance?" Your leading article took up the theme of last year's for academics. Since there seems to be considerable confusion about the facts, perhaps you will allow me, as chairman of the body which represents the university authorities in negotiating non-academic salaries, a chance to put the record straight.

There is neither space nor time to follow Mr Walker into all the side issues he has raised. Here I must concentrate on what he calls the grievance. This arises from the events following the report in December 1974 of the Houghton committee, whose terms of reference excluded university teachers. Nevertheless, in framing their recommendations for the salaries of teachers in further education, the Houghton Committee made comparisons with university teachers. They did not say that the two groups were comparable. The principle they sought to establish was that those further education lecturers recruited on an undertaking comparable to that done in a university should enjoy broadly comparable career prospects to those of their university counterparts.

In fact the Houghton further education scales, effective from May 24, 1974, put the university scales of October 1, 1974, at a considerable disadvantage. The University Authorities Panel and the AUT made immediate representations to the Government, which accepted that there was a disparity, even in its own interpretation of what Houghton required, which needed to be put right. Because of the 12-month rule in the then pay code an immediate increase was possible for university teachers, but the Government agreed that there could be no such adjustment in the further education scales. The result would be put into effect from October 1, 1975; it would be aided in Stage I, from the same date, the case of living compensation for the period October 1, 1974, to September 30, 1975, allowed by the social contract.

No agreement could be reached with the DES on the amount of the increase that was needed to meet the requirements of Stage I, and the question was to be put to an independent arbitral tribunal in June 1975. In its findings the tribunal accepted the Houghton principle as set out above, but added that comparability did not mean parity and further that there existed between the two groups a difference in the further education differences which merited recognition. The tribunal awarded university teachers scales for Stage I which were substantially above the DES offer, and ruled that the cost-of-living increases in respect of the period between October 1, 1974, and September 30, 1975 (i.e. Stage I) could be added by further negotiations between the parties. This while was to take effect from October 1, 1975.

When the "collection award" could be implemented the Government introduced the restricted pay policy of the counter-inflation White Paper of July 1975. The university negotiators were able to safeguard the payment of Stage I on October 1, 1975; but whereas the cost of living rose by over 26 per cent in the year to September 30, 1975, the Government restricted Stage II, in accordance with the 6 per cent limit of pay policy, to 10 per cent. Meanwhile other groups, including further education teachers, with settlement dates earlier than October, 1975, were able to secure increases of the order of 20 per cent.

University professors were hard hit by the restrictions in the July 1975 policy, partly because of the £8,500 upper limit for increases, and partly because, although, pay policy apart, their salaries are regularly reviewed and increased within the professional range, few are on formal incremental scales.

Democracy at work

Sir,—Whilst being highly sympathetic to the intentions of the arbitration tribunal and severely depressed academic salaries, the Government has not dispensed these facts, and has agreed in a review of the anomalous situation of university teachers' pay as soon as pay policy permits. University teachers have accepted the restrictions on increases called for by the Government's counter-inflation policies in the past two years, but it is surely right that they should press, as soon as conditions allow, for the restoration of what they lost by little more than an accident of timing in 1975.

It is not a question of jealousy of other comparable groups in the public sector. It is a question of securing proper recognition, however belated, of an arbitration award and, even more important, of trying to prevent further damage to the already impaired ability of universities to recruit and hold staff of the quality required to ensure the making of their essential contribution to the future of the country.

Yours faithfully,
GEOFFREY TEMPLEMAN,
Chairman,
University Authorities Panel.

Sir,—Last week's *THE TIMES* (May 13) contained both an article and an editorial about university teachers' pay and although some of the points made were valid others were not. Your editorial alleges that an important principle beginning to dominate the pay code is that of "comparability" in comparison to civil service grades. Beginning? As early as 1964 these comparisons were the mainstay of AUT evidence to the National Income Commission and although we have had negotiating services, the Civil Service Commission and 1970 these comparisons have been a regular feature of our claims. It is not only we who formulate the comparisons. In guidance given in paragraph 10 of the scientific civil service pay code, the following is stated: "The principle of comparability is a comparison to a type where the prime emphasis is not in teaching or running of a department."

(i) For promotion to Senior Principal Scientific Officer in an equivalent level in a scientific institution at a university only a single relationship in British universities, the relationship being of a type where the prime emphasis is not in teaching or running of a department;

(ii) For promotion to Deputy Chief Scientific Officer or equivalent in a university, the special responsibilities and exercise the special responsibilities of a Professor with relatively few administrative or teaching duties."

While it is true Houghton showed that the policy of senior lecturer maximum had a shortfall over the lecture maximum, you did not point out that this was primarily caused by the Burnham negotiations over a period of years dolcemente distributing money in wage settlements to favour those towards the bottom of the scales in the further education/polytechnic field.

This depressed the maximum of the further education senior lecturer and hence the shortfall, since in university negotiations the money distributed rather than the percentage basis throughout the scales and grades.

But over a decade of years up until Houghton the total percentage of pay increases in the further education/polytechnic sector were the same as those to those in the university sector.

Houghton, therefore, although purportedly equalizing a situation in fact gave a substantial feed in further education salaries over university salaries which was not broadly equivalent to those in the university sector.

Finally, you say that to give university teachers their just salaries would "fuel inflation". I must say that I have not noticed that the failure to satisfy university teachers' pay policy has done anything to "fuel inflation" and why should the reverse be true?

Yours sincerely,
LAURIE SAPPER,
General secretary,
Association of University Teachers.

Power and responsibility in local government

Responsibility is a multi-faceted concept, composed of inter-dependent elements. The first—and the most important—is accountability, which is the ability to give an account to another of what one has done or not done. It is the antithesis of autonomy, where accountability is to oneself alone. Responsibility to explain in someone else, who has authority to assess the account, and allocate praise or censure.

Secondly, responsibility means being the cause of an action. Being responsible for something suggests that one is its origin and creator, or continuing motivator or controller, or authorizer. This element links to the first in the sense that one should be accountable for what one has caused, determined or authorized, or for what one could have caused, determined or authorized, but decided not to.

Thirdly, responsibility means obligation. Having responsibility for something entails that one has a duty to perform. Some functions or tasks or roles have been laid on one. This element is linked to the first in that one is answerable for the performance of the duty, and that one has the capability to perform it or to control its performance. To be accountable for the accomplishment of an obligation implies that one is to determine, control or authorize what is done.

Fourthly, responsibility means deciding with concern for consequences. It is the opposite of automatic, arbitrary and rash decision-making. It entails exercising prudent forethought and considering the implications of one's act in the light of the performance of an obligation should be a reasoned explanation. It is not enough to say, "I did it and I responded"; one must show that consequences were considered. Having to justify one's act to another who has the authority to encourage or regard the consequences of one's acts.

Implicit in these four elements of responsibility—accountability, causation or authorization, obligation and concern for consequences—are three further features. Responsibility involves a relationship between the one who gives the account and the one who receives it, between the one who performs the act and the one who authorized that act and its corresponding authority and power. Responsibility is a relationship in which the former is sensitive to the latter's wishes, demands, interests and needs. It is a relationship in which the latter has the authority to reward or punish, to encourage or discourage the former's actions.

But, seemingly, although one may control the other, the latter is not an instrument, there being no account to give of what one has done or not done. The latter is not a mere tool, therefore, entails the empowerment of the former by the authority and powers conferred upon him. A responsible person requires a certain freedom of choice to be free to act in a definite way by default. Discretion is essential, especially if the responsible actor is to be influenced by his assessment of the consequences of his actions.

Thus, for one person or institution to be responsible to another, arrangements are needed to communicate information about the act worthy of the function to the one assessing. The contract used in the assessment to judge how adequately the one accessible has acted. Responsibility requires accessible information on which to base judgment.

Layfield report

The relationship between responsible government and its financing was discussed in the Layfield report on Local Government Finance. Layfield, responsible local government means that the local authority is responsible for providing a service or for deciding whether to provide more or less taxation.

This view is based on an argument, authoritatively expressed by a number of major inquiries—for instance Holdens in 1918 and Polden in 1965—that responsible policy should be taken with an awareness of the consequences of how the expenditure is to be financed. Aspirations and resources need to be brought into balance. Both need to be focused and reconciled at one point. Other considerations, such as the need for more ambitious and outstrip available resources, but these are not the primary concern.

Layfield found that present financial arrangements do not encourage responsible local government because there was no close relationship between local expenditure and local taxation. The reason was that a high proportion of local authority expenditure was met from central government grants: a unaccountable expenditure. In 1966-67 the central government grant was 51 per cent of total expenditure. This high and increasing grant severed the direct link

between spending and taxing upon which responsible government is based.

The fact that a high level of grant was accepted by the local authorities was argued if the main responsibility for local government expenditure activity for local government expenditure activity for local government were to lie with the central government. In that situation local government did not require any additional sources of tax revenue: rates could remain as the sole local tax.

But if the main responsibility for local government expenditure and its financing were to lie with local government, then the local grant had to be reduced. It was argued that the local government should be able to raise its own income tax to reduce grant to at least 50 per cent. In fact, the committee found that if the objective of grant were limited simply to equalization, to compensate for disparities in resources and spending needs, then grant could fall to 40 per cent. So the Layfield solution was that local income tax would take up the financing of 25.5 per cent of local expenditure previously provided by grant.

Critics of Layfield, however, assert that there is no connexion between grant and responsible local decision-making. If there were no grants, and local authorities had to finance their expenditure totally out of their own resources, they would not necessarily guarantee local responsibility, because the Government could still have a large number of policy directives that could severely constrain local authorities.

On the other hand, even if local authorities were financed totally out of grant, as long as it were in the form of a block general grant, without strings attached, local authorities would be free to spend the money as they wished. The source of the finance, it is suggested, is irrelevant; what matters for a responsible local authority is the freedom to spend the money, and accountability to its voters for the way that money is spent.

Francis Cripps and Wynna Godley of the department of applied economics at Cambridge alleged that the "total confusion" in Layfield's argument is that which "suppresses local autonomy to derive uniquely from its power to raise taxes, thereby ignoring the autonomy that derives from a grant that is not hypothecated" (pledged in a particular budget).

There is also the argument that the higher the percentage of grant the more effective will be the central government's influence. This argument is based on the "padding effect" in theory a high level of block grant should help to make the local electorate aware of the expenditure decisions of local authorities by multiplying their influence on the rates.

If rates continue only a small proportion of an authority's income, any small increases in expenditure will have a disproportionately large impact on rate levels. For instance, if an authority which expects to spend £100m receives a fixed block grant of £50m, the remaining £50m has to be raised from the rates. If the authority subsequently decides to spend 1 per cent more—£10m—the extra million has to come entirely from the rates, which to meet this expenditure have to be raised to £51 million—an increase of 2 per cent.

By contrast, if the block grant had been £75m, with rates having to meet only £25m, then a similar 1 per cent increase in total expenditure would increase the rates by £1m on £25m, or 4 per cent. In the latter example the taxpayer would be faced with a noticeable increase in rates as a result of the former, although the same increased expenditure is involved in each. Thus with a higher level of grant, "the sensitivity of rates to local decisions on marginal expenditure has actually been increased."

This argument—that responsible local government is possible—even if it is dependent on a high grant for financing its expenditure—is defective because it is based on a narrow concept of responsibility, which emphasizes the need to focus on one point a variety of political factors. When the political dimensions of a high grant are considered it becomes clear that responsible local government is not encouraged.

Whence came it a peponderant and growing part of local revenue, the Government should seek to ensure that it is spent in accordance with national policies and priorities. The grant represents money that central departments have fought hard to obtain against the Treasury and other departments with their own special concerns.

Each department seeks to advance the particular service it looks after—education, housing, social services or roads. Civil servants and ministers, having fought hard for grant on behalf of their service, are unlikely to relinquish their concern with the money once it is handed over to local authorities to spend. As custodians of taxpayers' money and as defenders and promoters of particular services, they wish to ensure that the grant is spent on their services, as they said it would be.

Civil servants also wish to protect their minister from criticism in Parliament about the poor performance or inadequacy of services. A high grant, therefore, pulls the central civil service to involve themselves in local affairs. Central civil servants and ministers,



Frank Layfield, QC: "a subtle ogre"

observing the high level of grant, feel that they should intervene in local government matters. Similarly local authority officials and councillors, recognising the high level of grant, feel that they have little justification for existing departments. The political consequences of a high grant are to increase the pressures for central involvement in local government.

However, a high grant may be significant, not so much for setting up pressures that lead the central government to intervene in local government affairs and to assume responsibility, but much more for making local authorities feel less responsible. Local government responsibility is undermined by a high level of grant, and—especially if it rises each year—because the attention of a local authority is turned more to the centre than to its voters in the local community.

The size of the grant is more important to a local council than the wishes of local citizens. Through the granting effect, quite a small change in the grant of the centre, in the total, in the formula, and in the actual distribution can have major consequences locally, producing for some authorities an unexpected windfall and for others a dramatic shortfall, even if they had all decided on similar increases of expenditure in that year.

Political pressures

In this situation, neither the public nor elected members can assess whether the less grant is a result of decisions of the local authority, or of central government, or of fortuitous changes in the grant. A high level of grant in practice does not enable local taxes to reflect local spending decisions. Responsible government is undermined.

The argument that a grant of whatever level, even 100 per cent, does not undermine local responsibility as long as the grant is "unhypothecated" is based on a restricted concept of responsibility. Cripps and Godley assume that responsibility can be meaningful simply if it relates to the distribution of a given level of expenditure between services. They ignore the wider view of responsibility, which emphasizes the need to focus on one point a variety of political factors, not only those concerned about spending between different services, but also those concerned about the financing of that expenditure and about the level of the expenditure itself.

The Cambridge economists fail to take into account the political implications of the financial arrangements they advocate. Both central government and local authorities are elected; they have political bases and behave politically. They will seek political advantage for themselves from a grant system. When grant is spent on behalf of their service, they are unlikely to relinquish their concern with the money once it is handed over to local authorities to spend. As custodians of taxpayers' money and as defenders and promoters of particular services, they wish to ensure that the grant is spent on their services, as they said it would be.

When it is so dependent on a large grant, that is also unstable, a local authority is transformed from a body that takes its own decisions and is responsible for them to local electors, to become itself a pressure group on the centre urging more grant. It seeks to make out that it is a special case with distinctive features of which the existing grant settlement has not taken account. In turn the centre will respond with inspectors to check up if the special case is justified and if the need to spend is present. So again the departments are pulled into the detailed

affairs of local authorities by a high level of grant.

It is also said that a considerable degree of responsible local government could exist with a high grant, if the centre simply sets the total of local government expenditure and leaves local authorities to determine their priorities within the total. This approach again neglects the pressures for central involvement in local politics. A total has to be acceptable politically. The total, therefore, has to be broken into its components so that the way the total was constructed can be justified.

To show that the total makes sense involves examining in detail its make-up. Further, the main concern of the arguments each year will not in fact be about the total, but about alterations in it: attention will concentrate on the changing elements, and controversy will arise over whether they are justifiable.

The size of the grant is more important to a local council than the wishes of local citizens. Through the granting effect, quite a small change in the grant of the centre, in the total, in the formula, and in the actual distribution can have major consequences locally, producing for some authorities an unexpected windfall and for others a dramatic shortfall, even if they had all decided on similar increases of expenditure in that year.

The Layfield argument is subtle. It is not saying that a reduction of grant and the introduction of local income tax will automatically guarantee local responsibility. The report states clearly that it would not be worth the expense and upheaval of doing so unless there were also a change of political attitudes. There has to be a political will to make local responsibility work; there has to be a clear belief in the value of local government.

With the Layfield proposals, if this belief materialized, then the financial arrangements would be designed to support and buttress local government responsibility, and not to undermine it, as the high grant does at the moment. Financial structures and procedures generate and create political pressures. As the Layfield report says: "While it is not possible to demonstrate a direct connexion between the proportion of grant and the extent of government intervention, we are satisfied that the amount of grant and, more importantly, the fact that total grant was increasing to make development of services possible, powerfully reinforced the political pressures for government intervention."

In society there are pressures for centralization and standardization, and for achieving national uniform standards of service everywhere; but there are also other pressures for decentralization, for devolution, for involvement in decision-making by community groups and for public participation, in order to vary services to meet local conditions and wishes. A high grant does not create the pressures for centralization; it creates them. Similarly, a low grant will not create the pressures for local responsibility, but it will sustain and not counteract them.

G. W. Jones

The author is professor of government at the London School of Economics. This article is an extract from his inaugural address, delivered on April 28.

BOOKS

On mathematical truth

Aristotle's Metaphysics, Books M and N translated with introduction and notes by Julia Annas

Aristotle's Metaphysics, Books M and N, is primarily an attack on Platonist philosophies of mathematics. "Platonism" is a generic name for philosophies that explain the truth of mathematical statements in terms of the existence of abstract objects, numbers, and relations that hold among them.

Aristotle argues in Books M and N that Platonism is both unnecessary and incoherent. He believes one can give an account of mathematical truth that does not invoke the existence of abstract objects. Mathematicians do not study a special domain of objects, they abstract and study certain properties of ordinary objects.

Like so much of Aristotle's work, Metaphysics M and N are in response to the philosophical beliefs of others. This makes M and N especially difficult for the exact structure of the mathematical beliefs Aristotle attacks is not clear. Julia Annas's 90-page introduction does an admirable job of setting the stage: by the time one reads the text, one has the comfortable feeling of being able to anticipate the problems Aristotle will confront.

She also offers clear, definite interpretations of Aristotle's darker comments. For example, Aristotle attributes to Plato a belief that all numbers can be derived from the principles of "one and the indefinite dyad." What are these principles? The problem is that the principles for which there is textual support do not seem to be capable of generating all numbers.

The debate between Platonism and anti-Platonism is still active. It is ironic that while profound restrictions to philosophy have recently been placed by anti-Platonist, two great contributions to logic of the past hundred years—Frege's formalization of the predicate calculus and Gödel's proofs of incompleteness—have been made by anti-Platonist Platonists.

Indeed, if there is any problem with Annas's use of modern authors it is that she accords to Frege the unquestioning respect previous generations accorded Aristotle.

There would, however, be merit in seeing whether Frege's criticism can be dismantled or whether there is a brand of abstractionism that circumvents the Fregean attack. Anti-Platonist philosophers have recently tended to focus

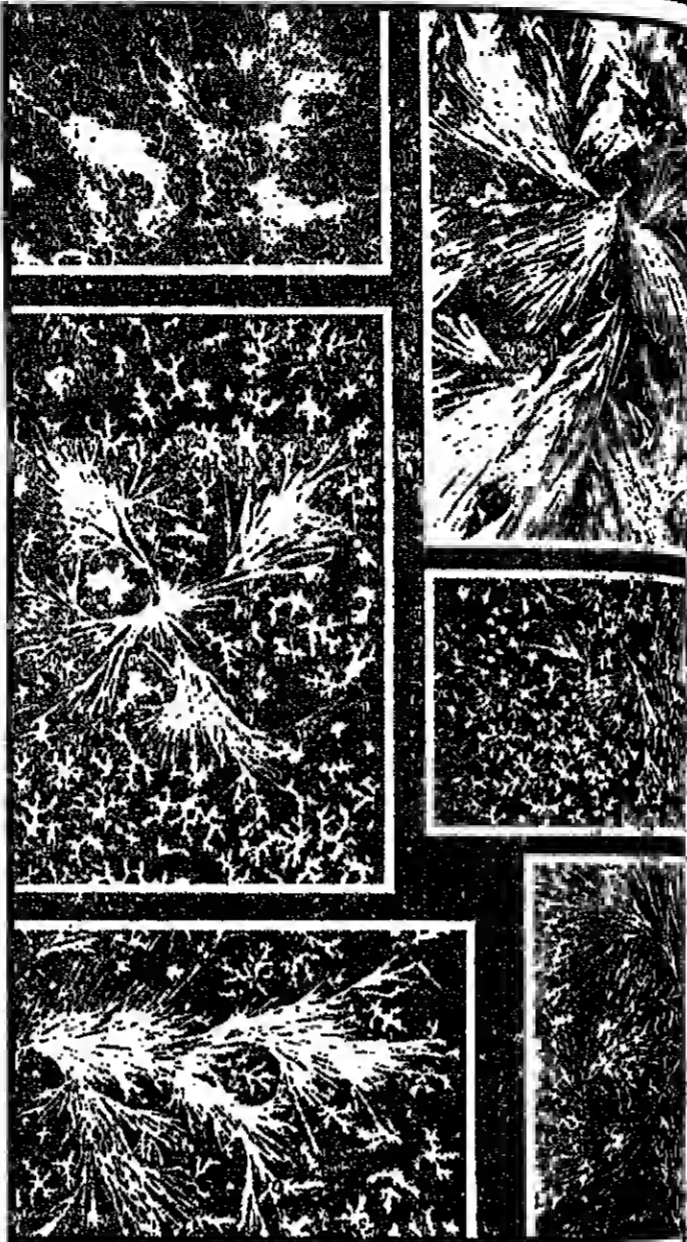
either on specific ontological debates or, as with Dummett and Wittgenstein, on a critique of the theory of meaning for language as a whole. I think Dummett is correct that one should avoid engaging in crude debate over alternative pictures of mathematical reality. But I wonder whether a coherent anti-Platonist can restrict itself to mathematics and avoid Dummett's global approach to the theory of meaning.

There are certain methodological problems which also ought to be mentioned. First, Annas says that Plato is a "realist" in taking geometry to be concerned with objects that genuinely exist, but not in the spatio-temporal world around us.

Secondly, Annas says that the geometry of Plato's time can fairly be called "Euclidean", although Euclid himself wrote the Elements several generations later. It is then said that Plato believed the axioms of "Euclidean" geometry were self-evident.

Annas's work as a whole, however, is one of great care. Her translation aims toward the literal, capturing the brusque note that the Greek text, for the reader who does not know Greek, this translation provides as faithful a counterpart to the Greek as the exigencies of translation will reasonably allow.

Jonathan Lear



Crystalline plecterites of precipitated salts, as seen under a microscope. Such salt crystals are deposited on the shores of the Rift Valley in Kenya when the lake level falls, through lock of rain or less evaporation by the sun. In solution they create an unusual chemical environment, one which could kill a thistle weed but which supports remarkable profusion of life. From Pyramids of Life, an Inventory of Nature's Fearful Symmetry by John Reader and Harvey Cross, a foreword by Niko Tinbergen. Published by Collins at £6.95.

The historian in the philosopher

Peoffs and Refutations by Imre Lakatos edited by John Worrell and Elio Zahar Cambridge University Press, £7.50 ISBN 0 521 21078 X

Anyone present when Imre Lakatos presented the Euler theorem on polyhedra material in Proofs and Refutations at Popper's seminar at the London School of Economics more than 15 years ago was immediately aware of a startlingly new and deep approach to the philosophy of mathematics and to more than a personal sadness at his early and unanticipated death in 1974.

The editors (John Worrell and Elio Zahar) tell us that many mathematicians who read the earlier printed version in journals expressed doubts that "while the method of proof analysis described by Lakatos may be applicable to the study of polyhedra, a subject which is mathematical and where the counter-examples are easily visualizable, it may be inapplicable to 'real' mathematics." This points up the difference between the effect of the spoken and printed word, but it is met here by a second element which centres the analysis of Euler's theorem into the algebraic topology arena, and, more, by the appendix which studies the origins of the "method of proof-analysis": the difficulties over non-uniform convergence in the first half of the nineteenth century.

It is striking that Seldel, in his discovery in 1847 of the result in Cauchy's "proof" of the non-theorem that the sum of a convergent series of continuous functions is a continuous function, did not initially discover the concept of uniformity. He was also aware of the methodological innovation of "Step by step" from the certainty just achieved, that the theorem is not universally valid, and hence that its proof must rest on some extra hidden assumption, on then subjects the proof to a move dated analysis. It is not very difficult to discover the hidden hypothesis. One can then infer backwards that the hypothesis is not satisfied by series which represent discontinuous functions, since only those can the agreement between the original correct proof-sequences, and what has been on the other hand established by Lakatos's method: a global counter-example to a primitive proof is discovered, after a proof (that is, a rough thought-experiment or argument breaking the primitive conjecture into subconjectures or lemmas) has been constructed. The proof is reexamined until the guilty lemma, to which the global counter-example is a local counter-example, is spotted. The guilty lemma is built into the primitive conjecture as an extra condition and the improved conjecture assumes the mantle of theorem-hood in its turn. Frequently, too, proofs of other theorems are examined and the same new concept is found in several.

Lakatos never fell into the trap of sliding over from the descriptive to the prescriptive; so that his philosophy of mathematics is always also history. Yet it presents two problems in the Cauchy context,

which recur elsewhere. First, Fourier's example of a step-function expanded as a series of cosines dates back to 1827, why did 35 years ensue before a serious discovery? Lakatos is in no doubt that the main reason was the "prevalence of Euclidean methodology" in this case, was the inspiring rigour in the calculus, and the Euclidean deal with counter examples by the heuristically sterile "exception-barring method"—that is, by allowing as mathematical statements some which "although they hinge on true principles, nevertheless admit restrictions or exceptions in certain cases..." (the quotation is from Lakatos's character Sigma in the earlier Socio-rational dialogue about polyhedra; with real mathematicians the subtlety is not always so transparent). The two activities of guessing a theorem and proving it were rigidly separated; if a conjecture was wrong one had to start again from scratch. Fourier, however, discovered in the forties when in the twenties and the clarification of non-Euclidean geometry by Lobatschewsky in 1829 and Bolyai in 1832 had "shattered infallibilist conceit".

The other problem is more serious; history, especially the history of science, is always so extremely complicated and clear philosophical ideas can only be derived by simplifying—yet how can we tell whether the simplifications distort step? That we are trying to establish a function, looking at his discontinuous function, or his series consists of a series of lines alternating above and below the axis

together with the perpendiculars joining them, which themselves form part of the graph. When Cauchy produced the analytical definition of continuity this "continuous graph of Fourier" became a discontinuous function, and Cauchy's proof of his non-theorem was meant to discomfort Fourier, the guess being that at the jumps Fourier's series did not converge to the function, since we now know that the series converges to the average of the values on either side.) Yet all this, complicated enough, is the evidence of the latest symptoms of the "step by step" method of Lakatos, conceived and acted upon by Lakatos and his colleagues in the 1960s. The purchase photographs of the 2000 libraries are being sold for a more affordable price. The purchase photographs of the 2000 libraries are being sold for a more affordable price.

Popper showed that those who claim that induction is the scientific discovery are wrong. These essays intend to show those who claim that deduction is the logic of mathematics are wrong. And, it is granted, it is mathematics very which we want to understand, not mathematics as such. The whole book is a delightful read, is of interest to anyone concerned with mathematical education at level. The Wiener volume is the latest in the MIT Mathematics of the Times series, a series of books conceived and acted upon by Lakatos and his colleagues in the 1960s. The purchase photographs of the 2000 libraries are being sold for a more affordable price.

BOOKS

Reference & pamphlets Librarianship

British Librarianship Today, edited by W. L. Saunders, is a survey of British libraries which updates and replaces the volume published 11 years ago under the title Librarianship in Britain Today. It costs £8.25 (£6.50 to members) and can be bought from the Publications Department, The Library Association, 7 Ridgmount Street, London WC1E 7AE.

Periodicals

The Warwick Guide to British Library Periodicals 1750-1970: A Check List, containing over 4,000 entries, has been compiled by Roydon Harrison, Gillian B. Woolven and Robert Duncan at the Centre for the Study of Social History at the University of Warwick and published by Harvester Press at £26.50.

Naval history

Naval History Part One, the fifth volume of the National Maritime Museum's Library catalogue by M. W. B. Sanders, which covers the period from the Middle Ages to 1815, has just been published by HMSO at £12.00.

African studies

African Studies since 1945: A Tribute to Basil Davidson, edited by Christopher Eric and published by Longman at £7.00 and £3.50 contains papers which were first given at a seminar in November, 1974, at the Centre of African Studies, University of Edinburgh, in honour of Basil Davidson's sixtieth birthday.

Bibliography

W. H. Hudson: A Bibliography by John Payne attempts to record all Hudson's important writings, including books, pamphlets, contributions to periodicals and translations, as well as the important works written about Hudson himself. Published by Wm. Dawson at £11.00.

Heads of state

Poland, a chronology of the heads of state with commentaries by Richard Hodges is published by Academic and Business, Murrumbidgee, 6 Broadrick Road, London SW17, at £2.40.

Proceedings

Proceedings of the Royal Institute of Great Britain volume 49, covering the Friday Evening Discourses which were given during 1976 and is published by Applied Science Publishers at £12.00.

German synonyms

Third edition of Dictionary of German Synonyms by R. F. Barrell, published by Cambridge University Press at £10.50 and £3.95. The book has been revised, misprints corrected, and where space permitted, example sentences and explanations have been improved.

Books on war

G. S. Enns has compiled A Subject Bibliography of the Second World War: Books in English 1939-1974 which lists under subject headings the books written in English between the Second World War and the end of the world war. Later supplements will keep the book up to date. Published by Andre Deutsch at £11.95.

Accountancy

The University of Alabama Press has inaugurated a new series of books in accounting history with the publication of The Evolution of Accounting to 1925 by S. G. C. W. Kilmister. It costs £4.90.

Poetic ills

Lost Hearings in English Poetry by David Holbrook Vision Press, £5.80 ISBN 0 85478 493 4

This is an important and thought-provoking, if terse, imperfect book. There is one feature of the intellectual scene in our time, in particular as it includes the literary scene, that on reflection both surprises and disquiets. The tenacity, and the perhaps, is for writers and thinkers their own speciality. Philosophy, psychology, the physical or biological sciences, human ecology, political science, economics, and what I should like to call the theory of culture, fail to come together and deepen each other. Each advances on its own road, and what a man as opposed to a researcher is to believe, is left for the scribbler to say. Much new writing, especially poetry, follows the same seraphic lead. There is a belief, salutary up to a point, that the writer should draw sustenance from the everyday as regards both language and substance, and the result is diluted, chummy, trivially, indeed can be the everyday not tend toward the trivial, if there is a lack of a larger frame within which to see it? Well, the answer is that it might, of course, given a truly Blakean attitude, which is to look at it. But Blake does not flourish either in a secular intellectual environment.

It was not like this a hundred years ago, nor does it so much look like this on the Continent today; perhaps there is another candidate for the English title, everyone likes to talk about. Mr Holbrook draws a good deal of his Continental or American thinkers in his attempt to reopen some of our lines of intellectual communication and to show how great a price our behaviourist-intellectualist mindsets have exacted. Some of his Continental or Anglo-Saxon authorities (Buber, Marjorie Grene) are familiar names, others less so. Certainly his efforts to reactivate our intellectual landscape are extensive and varied.

But it is the bridge built across in today's creative writing (or any, how, yesterday's) that is the nerve of this book. Behaviourism and materialism in our scientific and general outlook on literature, Holbrook argues, with a cut of defensive "realism" which in the end fosters a kind of cynical nihilism, a vague for the aridly sensate, sexually as cultus and exhibitionist, and what in the final analysis must be taken back to a schizoid, delaminated and mad destructivism. The argument sets Pound's *Make it plain* in a perspective of the sterilely satiric and limiting of the "English literature" variety of forms of art. In Hughes's *Crow*, and rounds off this section of the book by a severely and justly adverse account of some of the closing poems in Larkin's *Collected Poems of the Twentieth Century Verse*. (It is a pity that an arbitrary number of misprints "Larkin" should, so far as I can see, appear once as "Cohen", p 186.)

Opposed to this whole trend is the sense of "encounter", the "intentionality" of life in every form (what Leavis calls "nexus") and, crazily, transcendence and the lovingness for the world of the integrated consciousness, that Holbrook traces across from Buber against the "new" existentialism (as against the *musée-existentialism* of Sartre and Heideggerian Angst) through corresponding developments in psychology and "philosophical biology" and finally into such poetic counterpoints as Leavis's "Among School Children" and

some of Hardy's 1912-13 poems (over this, Holbrook's Latin is not quite right, but it does not matter). Holbrook is brief and inconclusive about Leavis, but his senses that Leavis's strategy of disengagement from the philosophical implications of his work may paradoxically have contributed, albeit indirectly, to the sterile clarity of the time.

I have left myself little space for saying why I think the book very imperfect. First, Holbrook's handling of a literary critic is, briefly, theme. Doubtless one must examine the poet's "philosophy" not just his language and art; but if that becomes only a kind of *impasto* or worse, a paraphrase of it, the critic's contribution is lost not gain; and I think that over the close of "Among School Children" sometimes elsewhere perhaps, Holbrook falls into this. He is also unsympathetic to satire and to the dramatic poem. The *Widow* is naturally enough from his own in-sensitiveness; as a result, the light shifts and self-deprecations of Leavis's *Widow* are lost to him. It is a pity that the visionary gleam that can find no place for irony and self-irony has its pallid side.

More serious, because up to a point it calls the whole precious and the whole arguable in question, is the element of myth in this book. To take the case of 1926 or the Hardy of 1912 as one of our lives lends itself to an archaizing mythology that suggests, anyhow, perhaps, the role of the myth in the only really formidable anti-life force, and the creation as the historically dead-and-gone. The literary becomes too apocalyptic and hence a little tabloid. Finally, the essential level at which the argument is conducted with scarcely bear the weight of it. Life, which transcends physics and chemistry, cannot be explained by reductionism, excluded. Yet... there is... a great deal to suggest the need for a radical re-evaluation of the prevalent view. There are follow-up, as so often later, the uncertainties which Holbrook calls on again and again; but in the end "Gentry, Whitman, Fairbank, Leavis and Milton" or "Buber, Wittgenstein, Whitman, Melanie Klein, Stieglitz, Wundt, Melanie Klein, Muslow and others" are self-defeating or catalogue. Certainly, Holbrook effectively recapitulates his assertions; but "assertion" is the word—the sense of dogma and selectivity becomes dispiritingly pervasive.

Holbrook has done much, and done it where there is a vacuum, that the rest of us neglect. Why, then, of what is left undone? Because exactly the fact is the important one. This book could easily be labelled as derivative, even banal in a good many of its findings. But why have we no better? Precisely because of the situations that diagnoses and we neglect. What would it be, says that this book bridges, but at the level of the truly powerful, subtle, first-hand (I think possibly of Whitehead) is not likely to evaluate the single-handed in an intellectual scope of clarity and fragmentary, transcendence and the "brook's work is what we deserve better than what we deserve. His very shortcomings are the ultimate, one might say, of its diagnosis. It is no better than it is, because we are as bad as we are and core for that so little, and so many trifles so much.

John Holloway

Reviewers

John Holloway is professor of English at the University of Cambridge and a fellow of Queen's College; he has recently published *The Proud Knowledge* and a book of poetry entitled *Planet of Winds*; C. W. Kilmister is professor of mathematics at King's College London; David Martin, professor of sociology at the London School of Economics, is author of *The Religion and the Secular* and *Tracts against the Times*;

R. C. Richardson is shortly to take up an appointment as head of history at King Alfred's College Winchester and is author of *Parliament in north-west England*;

Donald Southgate is reader in modern political and constitutional history at the University of Dundee and author of *The Passing of the Whigs* and *The Most English Man*;

Graban Zellek, lecturer in law at Queen Mary College London, has a forthcoming book entitled *The Prisoner and the Law*.

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The department is looking for someone who is thoroughly familiar with recent developments in linguistic theory, and is able to apply these to the synchronic and diachronic study of all aspects of the English language. Since he or she will be expected to teach at all student levels, didactic qualities will be highly valued. He or she will, finally, be expected to take a share in the department's administrative duties. Further information can be obtained from the chairman of the nomination committee, Prof. Dr. A. Cohen, Engels Instituut, Oudehoed 6, Utrecht. Tel: 030-33 41 14. Applications, accompanied by a curriculum vitae and a list of publications, should be in the hands of Professor Cohen within a month of the appearance of this advertisement, at the above address.

UNIVERSITY OF CAPE TOWN
Appointment of **REGISTRAR**

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The post will be vacant from 1st July 1978, but it is intended that the successful applicant should assume duty as Registrar-Deputy during the second half of 1977.

Intending applicants are invited to obtain the information memorandum on this post from the Registrar, Summer Building, Room 1, University of Cape Town, Private Bag, Rondebosch 770.

Formal applications marked "PERSONAL AND CONFIDENTIAL" should be sent to the Registrar, not later than 30th June, 1977.

OVERSEAS TEACHING POSTS

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The University of Bucharest
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Degree, one-year post-graduate qualification in TEFL and substantial experience in TEFL, primarily at tertiary level, essential. MA in Linguistics, or diploma of ESP and teacher training desirable. Previous experience 30 to 50.
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THE BRITISH COUNCIL

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UNIVERSITY OF DAR ES SALAAM TANZANIA

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Application form and further details of the post may be obtained from the undersigned.

Latest date for receipt of applications is Friday, 3 June, 1977.

M. F. Kallagher, Secretary

ABERYSTWYTH UNIVERSITY COLLEGE

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M. F. Kallagher, Secretary

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M. F. Kallagher, Secretary

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M. F. KELLEHER, Secretary.

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Further particulars and application forms may be obtained from: Dean's Secretary, Royal Postgraduate Medical School, Hammersmith Hospital, Du Cane Road, London W12 0HS. Telephone: 01-743 2038 Ext. 350. Closing Date: Friday, 10 June, 1977.

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UNIVERSITY OF DAR ES SALAAM TANZANIA

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Assistant Research Fellow

Candidates should hold a good Master's degree in Economic or Managerial Sciences. Those with a first degree and substantial research experience at a university, national government department or public corporation or international agency will also be considered.

Salary scales: Research Fellow £2,720-£3,170 (bar) for single appointee; £3,170-£3,620 (bar) for married appointee. The British Government may supplement the salary of an appointee (see monthly allowances and holiday pay) to a maximum of £12,000 p.a. (including £2,000 p.a. for housing allowance and holiday pay) and £10,000 p.a. for research allowances. Detailed applications (2 copies) including curriculum vitae and list of referees should be sent by air mail not later than 29th June, 1977, to the Registrar, (Recruitment and Training), University of Dar es Salaam, P.O. Box 35091, Nairobi, Kenya. Applicants resident in UK should also send a copy to the Inter-University Council, 90/91 Tottenham Court Road, London W1P 0DT. Further particulars may be obtained from either address.

UNIVERSITY OF THE WEST INDIES—BARRADOS

Applications are invited for the post of **SENIOR LECTURER/LECTURER and LECTURERS/ASSISTANT LECTURERS** in the Faculty of Law.

Applications are welcomed from persons with knowledge of common law systems. The Faculty is particularly interested in applicants with interests in Comparative Law, Criminal Law and Criminology, Revenue Law, Labour Law and Family Law. The appointees will be expected to assume duties by September 1, 1977, or as soon as possible thereafter. Salary scales (from August 1977)—Senior Lecturer: \$12,500-\$15,000 p.a.; Lecturer: \$10,000-\$12,500 p.a.; Assistant Lecturer: \$8,000-\$10,000 p.a. (11 starting points). The University offers a range of accommodation facilities at a rental of 10% of salary. A housing allowance of 20% of salary is payable to staff who do not have their own housing arrangements. Up to five full passages on appointment and on normal termination. Study and Travel Grant. Detailed applications (two copies) giving full particulars of qualifications and experience, date of birth, marital status, and address of three referees should be sent as soon as possible to the Registrar, UNIVERSITY OF THE WEST INDIES, ST. AUGUSTINE, TRINIDAD AND TOBAGO. These particulars may also be obtained from the Inter-University Council for Higher Education Overseas, 90/91 Tottenham Court Road, London W1P 0DT.

UNIVERSITY OF WESTERN AUSTRALIA Perth

ENGLISH LECTURER/ SENIOR TUTOR

In the Department of English. Applications are invited from persons with postgraduate qualifications in English. The Faculty is particularly interested in applicants with interests in Comparative Law, Criminal Law and Criminology, Revenue Law, Labour Law and Family Law. The appointees will be expected to assume duties by September 1, 1977, or as soon as possible thereafter. Salary scales (from August 1977)—Senior Lecturer: \$12,500-\$15,000 p.a.; Lecturer: \$10,000-\$12,500 p.a.; Assistant Lecturer: \$8,000-\$10,000 p.a. (11 starting points). The University offers a range of accommodation facilities at a rental of 10% of salary. A housing allowance of 20% of salary is payable to staff who do not have their own housing arrangements. Up to five full passages on appointment and on normal termination. Study and Travel Grant. Detailed applications (two copies) giving full particulars of qualifications and experience, date of birth, marital status, and address of three referees should be sent as soon as possible to the Registrar, UNIVERSITY OF THE WEST INDIES, ST. AUGUSTINE, TRINIDAD AND TOBAGO. These particulars may also be obtained from the Inter-University Council for Higher Education Overseas, 90/91 Tottenham Court Road, London W1P 0DT.

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Universities continued

WALEs THE UNIVERSITY COLLEGE Aberystwyth CHAIR OF OLDFIELD The College Council invites applications for the vacant Chair of Oldfield in the Department of Education...

WALEs THE UNIVERSITY UNIVERSITY COLLEGE OF SWANSEA Department of Geography Applications are invited for a Lecturer in the Department of Geography...

WARWICK THE UNIVERSITY RESEARCH ASSISTANT IN THE DEPARTMENT OF CHEMISTRY Applications are invited for a Research Assistant in the Department of Chemistry...

Fellowships and Studentships

GLASGOW THE UNIVERSITY UNIVERSITY DEPARTMENT OF CHEMISTRY Applications are invited for a number of studentships in the Department of Chemistry...

BRADFORD THE UNIVERSITY MANAGEMENT CENTRE DOCTORAL PROGRAMME RESEARCH STUDENTSHIPS Places are available in the areas including:

BRADFORD COLLEGE Applications are invited for a number of studentships in the Department of Education...

BRADFORD COLLEGE Applications are invited for a number of studentships in the Department of Education...

LIVERPOOL POLYTECHNIC SCHOOL OF EDUCATION RESEARCH ASSISTANT IN ENZYME THERAPY Applications are invited for the above post from persons holding or expecting to obtain a good honours degree...

LIVERPOOL POLYTECHNIC SOCIAL STUDIES DEPARTMENT RESEARCH ASSISTANT Research Assistant required to participate in an interdisciplinary research project entitled 'Economy, Society and Class Relations in 20th Century Liverpool'...

ST. ANDREWS THE UNIVERSITY ST. ANDREWS UNIVERSITY DEPARTMENT OF CHEMISTRY Applications are invited for a number of studentships in the Department of Chemistry...

ST. ANDREWS THE UNIVERSITY Applications to the latter.

Polytechnics

SHEFFIELD CITY POLYTECHNIC FACULTY OF ART AND DESIGN PRINCIPAL LECTURER IN SCULPTURE Applications are invited from persons holding or expecting to obtain a good honours degree...

SHEFFIELD CITY POLYTECHNIC SENIOR LECTURER IN COMPANY ADMINISTRATION To teach the organizational and behavioral aspects of company administration on professional, degree and diploma courses...

ULSTER COLLEGE THE NORTHERN IRELAND POLYTECHNIC FACULTY RESEARCH OFFICER Temporary until 31 August, 1978 Salary Scale: £2,688-£3,367 To assist academic staff with research projects in Business Studies...

ULSTER COLLEGE THE NORTHERN IRELAND POLYTECHNIC Applications are invited for a number of studentships in the Department of Education...

LONDON, S.E.18 THE POLYTECHNIC OF BRISTOL Applications are invited for a number of studentships in the Department of Education...

BRADFORD COLLEGE Applications are invited for a number of studentships in the Department of Education...

LIVERPOOL POLYTECHNIC SCHOOL OF PHARMACY RESEARCH ASSISTANT IN ENZYME THERAPY Applications are invited for the above post from persons holding or expecting to obtain a good honours degree...

LIVERPOOL POLYTECHNIC SOCIAL STUDIES DEPARTMENT RESEARCH ASSISTANT Research Assistant required to participate in an interdisciplinary research project entitled 'Economy, Society and Class Relations in 20th Century Liverpool'...

ST. ANDREWS THE UNIVERSITY ST. ANDREWS UNIVERSITY DEPARTMENT OF CHEMISTRY Applications are invited for a number of studentships in the Department of Chemistry...

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BRADFORD COLLEGE Applications are invited for a number of studentships in the Department of Education...

COUNTY OF CLEVELAND THE POLYTECHNIC APPOINTMENT OF DIRECTOR DESIGNATE (Re-advertisement) Applications are invited from persons with academic and/or industrial experience and administrative ability for the post of Director of Education...

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BRADFORD COLLEGE Applications are invited for a number of studentships in the Department of Education...

Colleges of Higher Education

Bedfordshire Education Service BEDFORD COLLEGE of Higher Education Applications are invited for appointment to the following post as from September, 1977...

Bedfordshire Education Service BEDFORD COLLEGE of Higher Education Applications are invited for a temporary one-year Lecturer II post in Educational Studies for the 1977/78 session...

SOUTHAMPTON-LA SAINTE UNION COLLEGE OF HIGHER EDUCATION LECTURER Grade II in ENGLISH Applications are invited for the post of Lecturer in the English Department...

Colleges of Further Education

CORNWALL Camborne School of Mines SENIOR LECTURER/LECTURER II in MINERAL PROCESS ENGINEERING Applications are invited for the above post to assist in the development of a new degree course in Mineral Processing Technology...

THE OPEN UNIVERSITY POST-GRADUATE COURSES IN LANGUAGE TEACHING Applications are invited for three posts of temporary Lecturer in the Department of Language Teaching...

BUCKINGHAMSHIRE COLLEGE OF HIGHER EDUCATION Applications are invited for the post of Lecturer in the English Department. Applicants should have a good degree in English with some experience and a strong interest in Primary Education...

HEREFORD AND WORCESTER COUNTY COUNCIL WORCESTER COLLEGE OF HIGHER EDUCATION Lecturer in Psychology Applications are invited for a post of Lecturer in Psychology...

HEREFORD AND WORCESTER COUNTY COUNCIL WORCESTER COLLEGE OF HIGHER EDUCATION Lecturer in Philosophy Applications are invited for a post of Lecturer in Philosophy...

TESSIDE THE POLYTECHNIC RESEARCH ASSISTANT IN ENZYME THERAPY Applications are invited for the above post from persons holding or expecting to obtain a good honours degree...

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Colleges and Institutes of Technology

DUNDEE COLLEGE OF TECHNOLOGY Department of Surveying & Building SENIOR LECTURESHIP in QUANTITY SURVEYING Applications are invited from persons with substantial teaching and professional experience...

DUNDEE COLLEGE OF TECHNOLOGY LECTURESHIP in QUANTITY SURVEYING Applications are invited from persons who are graduates and/or professionally qualified in quantity surveying and who have a sound knowledge of the fundamentals of undergraduate education...

DUNDEE COLLEGE OF TECHNOLOGY LECTURESHIP in ACCOUNTANCY Applications should be honours graduates or hold appropriate equivalent professional qualifications. They should have practical or research experience and/or have experience of teaching at undergraduate or postgraduate level...

STUDENT TRAVELLER Glasgow Institute for Young Travellers Applications are invited for a number of studentships in the Department of Education...

INNER LONDON EDUCATION AUTHORITY LONDON COLLEGE OF EDUCATION Applications are invited for a number of studentships in the Department of Education...

WEST SUSSEX INSTITUTE OF HIGHER EDUCATION Applications are invited for a number of studentships in the Department of Education...

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Vertical text on the left margin: 1550

Vertical text on the right margin: 1550

STRANMILLIS COLLEGE BELFAST

Principal: JAMES POMFRET, M.A., B.Sc., M.Ed.

Stranmillis College is a College of Education, of 1,200 students at present, who are preparing to teach in nursery, primary and secondary schools through the Certificate (three years), B.Ed. Degree (four years) and Post-Graduate (one year) courses. The College is non-denominational; there is no religious test.

The College is pleasantly situated in an attractive wooded estate of some 45 acres, in a quiet residential neighbourhood on the southern outskirts of the City of Belfast. New building projects to the value of £2½ million have been completed in the last few years.

Re-Advertisement HEAD OF ENGLISH DEPARTMENT

Applications are invited from persons with appropriate qualifications and experience for appointment to this post from January 1st on the retirement of the present holder.

Salary: Head of Department Grade V £7,395 to £8,271 plus £312 p.a.

(a further adjustment, under the Pay Code, is due from April 1st)

Assistance with removal expenses from outside Northern Ireland.

Further information about the College and the appointment, and a form of application, may be obtained from:

The Secretary Stranmillis College Belfast BT9 5DY

Applications should be received not later than Friday, June 10th, 1977

Administration

World University Service (U.K.)

Graduate Administrator

The World University Service, an international development agency, is looking for someone to join a team running a scholarship programme for refugee students and academics from Latin America.

Duties will include co-ordinating the research of these scholars and servicing a key committee. It is therefore essential that applicants have substantial academic experience and are fluent in Spanish.

Salary will be on a scale £2,312-£3,512 p.a. plus cost of living allowance.

Further details and application forms from:

Helen Hockenham, WUS (UK)

9 Bruce Grove, London N17 6HA, Tel. 01-801 5003

The closing date for applications will be May 27, 1977.

THE INSTITUTION OF MECHANICAL ENGINEERS GROUPS A

SCHOOLS LIAISON OFFICER

The Institution is expanding its work of fostering school industry links, and needs an extra member of staff to contribute to a small team engaged in interesting and varied activities concerned with education and engineering careers. The post involves developing and administering various projects and will entail considerable contact with schools, industry, local authorities and the general public.

Applicants are invited from science graduates with good administrative skills who can draw and control budgets and who can communicate effectively at what level in industry and the educational establishment. Industrial experience would be an advantage. Candidates must be capable of operating with minimum supervision, and be prepared to travel throughout the UK, with an ability to drive a car (licence essential).

A salary of circa £1,250 p.a. is offered, together with L.V. 116 car, petrol, and a good contributory Pension Scheme and free Life Assurance.

Please apply with full details to: Mr. V. A. Jones, I.M.E. Administrative and Personnel Officer, 7th Institute at Stranmillis College, Box 23, Northgate Avenue, Ballymena, Co. Londonderry, BT23 6BN.

St. Thomas's Hospital Medical School,

Dept. of Surgery and Kingston Polytechnic

RESEARCH ASSISTANT

A Research Assistant is required to develop and apply ultrasonic probes to the measurement of the thickness of intimal walls in studies of vascular disease.

Applicants should be honours graduates in the physical/engineering sciences and will be expected to work for a regular 9 hours.

Salary £2,858-£2,985-£2,984 inc. supplement and London allowance.

Further details and application forms from: Appointments Officer, Kingston Polytechnic, Penrhyn Road, Kingston upon Thames KT1 2EE. Tel. 01-848 1798.

COUNCIL FOR NATIONAL ACADEMIC AWARDS

344/354 Gray's Inn Road, London WC1X 8BP

PUBLICATIONS OFFICER

AP4 E4,113-64,448 Inclusive of London Weighting

This established post includes responsibilities for the production of a variety of Council publications, maintenance of a small reference library and the provision of a general enquiry and public relations service. It offers scope to develop an interest in publishing, requiring an intelligent and creative approach to information handling, ranging from regulations for guidance to news bulletins for information.

Prospective applicants should preferably be graduates in an appropriate field and/or be able to offer suitable experience and may obtain further particulars from K. R. Booth, Assistant Secretary, to whom applications should be submitted by 27 May, 1977.

Overseas

WESTERN AUSTRALIAN MUSEUM

HEAD, DIVISION OF PROFESSIONAL SERVICES

Applications are invited for appointment to the above new senior position.

The appointee will be responsible to the Director for the Management, co-ordination and proper working of the Museum's professional service departments—Display, Education, Library, Local (including branch) Museum Services, Material Conservation and Restoration and Publications.

Applicants will be expected to have had relevant post graduate experience in one or more of the Museum's curatorial fields of interest (zoology, entomology, archaeology or history) and/or those of its professional service departments, and will preferably have already demonstrated an interest in museology.

As Head of one of the 3 main Professional Divisions of the Museum—the others being Natural Science (Zoology) and Human Studies—the appointee will be expected to deputise for, and act on behalf of the Director as required; report to him on the Division's work and management; provide proposals for preparation of estimates; supervise Divisional expenditure; and as necessary act as Departmental Head within the Division.

Museum staff are employed under the Museum Act, 1969-73; conditions of service are similar to those applying to officers in the State Public Service. The initial appointment will be subject to a 6-month probationary period and provision of a satisfactory medical certificate. The appointment will be made at Level A, Professional Division (Curatorial Officers) Salaries Agreement, 1970, at a present salary of \$20,849 p.a.

Applications entailing full personal particulars, qualifications, experience and names and addresses of 3 referees should be made to: The Director, Western Australian Museum, Francis Street, Perth, Western Australia, 6000, before June 10, 1977.

J. L. BANNISTER, Director.

ECOLE SUPERIEURE DE COMMERCE DE LYON

Applications are invited for the post of:

ENGLISH LANGUAGE TEACHER/ADMINISTRATOR

for this leading undergraduate and postgraduate business school. Candidates (graduates aged 25-35) should possess organisational ability, experience of teaching English to students or adults (preference given to CEF/ESP qualifications), some degree of numeracy and the capacity to play an active part in a management team in advanced business education. A reasonable working knowledge of French would be expected.

The post is seen as being a two-year appointment commencing 1st September, 1977. Starting salary from 3,200 FF per month depending on experience and qualifications. Interviews in London and Lyon in late June/early July.

Write with full curriculum vitae and names of referees (closing date 10th June, 1977) to:

Mr. M. A. Wondhoff, Responsable du Département Langues, Ecole Supérieure de Commerce de Lyon, 23 rue de Dordilly, 69130 ECULLY, FRANCE.

Murray Park College of Advanced Education Magill, South Australia

Heads of Schools

The college is situated on an extensive and attractive campus in the eastern suburbs of Adelaide close to the foothills of the Mount Lofty ranges. Most of the 120 full-time and 600 part-time students are enrolled in one of the courses for intending teachers but the college also offers awards in music, journalism, and other studies.

Owing to internal reorganization involving the group together of subject departments into schools, these senior positions have been created. Applicants are therefore invited from suitably qualified and experienced persons for the following posts:

Head of School of Teacher Education

Salary on appointment: 25,288 dollars

Head of School of Liberal Studies

Salary on appointment: 24,306 dollars

Head of School of Communication Arts

Salary on appointment: 24,306 dollars

Thin duties include exercising academic leadership in an appropriate area of expertise, and supervising and administrative functions.

Initially the college council will offer a contract for a period of three years with the possibility of entering their contract or renewing after that period.

Application forms and further particulars are obtainable from:

THE DIRECTOR, MURRAY PARK COLLEGE 15 LORNE AVENUE MAGILL, SOUTH AUSTRALIA 5072.

Closing date is 30 June, 1977

LINCOLN INSTITUTE A College of Advanced Education in the Health Sciences.

HEAD OF SCHOOL

SCHOOL OF COMMUNICATION DISORDERS

Applications are invited for the post of Head of School. The position calls for considerable academic/teaching experience in an appropriate professional area, and avoidance of leadership and well developed administrative skills. Interest and experience in research would be an advantage. The appointment can be made within the range \$42,974-48,000. Assistance will be given towards fares and normal expenses for an interstate or overseas appointee. The Lincoln Institute is a tertiary college funded by the Commonwealth Government. It offers degree and diploma courses in allied health sciences: physiotherapy, occupational therapy, nursing, medical record administration, ophthalmology, and prosthetics and orthotics in addition, departments of biological sciences, behavioural sciences, and educational resources support the various teaching programmes. The total student population in 1976 was approximately 1400.

The School of Communication Disorders is responsible for a 4 year course leading to the award of a Bachelor's degree in applied science. The major area of study within the degree is speech pathology, together with a full clinical education programme.

In 1978, academic staff will exceed 20, with additional technical and administrative support, for about 200 students undertaking the degree programme. The School also has several graduate students in a masters degree programme and is developing specialist postgraduate diploma courses.

Applicants and applicants, including the names of 3 referees and referees, should be directed to: Director, Lincoln Institute, 675 Swanson Street, Carlton, Victoria, 3053, Australia. Closing date is 1 August 1977.

Frances Gibb interviews John Pick who is the new director of arts administration at City University Middlemen who are 'more creative' than artists

Arts administrators have a poor image. Artists tend to see them as they do academics—as parasites on the world of the arts. In his new job as director of arts administration at City University, Mr John Pick has the task of defending both.

"The arts, he says, receive massive state subsidies and repay many times over. Most of the budgets of no less than £500,000 a year. There is a need for a middle man, with knowledge of accountancy, marketing and the law, but who is also creative."

His post at City fulfils a recommendation in the report on training arts administrators in 1971 by an Arts Council committee, under Mr Roy Shaw, now secretary-general. It said there should be a full-time director of arts administration staff, with both practical experience and ability to teach and initiate research.

City was proposing a one-year postgraduate diploma in arts administration, and there was scope for further degrees within a Centre for Arts and Related Studies, which was set up early this year under Mr D. E. Jenkins.

The diploma, one of the few in the country apart from PCL, there are courses only at Leicester and Manchester Universities. Revenues of 240 applicants for 20 places. Applicants need a degree or equivalent.

and probably some experience of arts administration. The course is both theoretical and practical, with students spending two terms in the university and one of secondment with an arts organisation. The Arts Council gives £15,000-£20,000 a year to support the course and bursaries to some 10 (half) of the students in any one year.

Students learn about organization of the arts in Britain, management, law, finance and accountancy. The diploma exempts them from the first year of a three-year honours degree in Arts and Entertainment so they are able to work in local government.

John Pick's brief was to develop a wide range of arts administration courses from this one within the centre, which runs the university's adult education, and courses in journalism, archaeology, and music.

He came from being director at the Dalhousie Arts Centre in Somerset, and with teaching experience at Nottingham College of Education, Cambridge College of Art and Technology and St Peter's College of Education, Birmingham.

Training arts administrators is important, he argues, because far from being merely "the man in the middle", the administrator can be the most creative person in the whole process: deciding what programme should go to what audience, and the conditions in which it should be offered.

With his appointment, research in arts administration has become possible, and several students are registering to work for MPhil degrees by thesis. At the same time, there are plans for a part-time MSc, which would be for practising administrators wanting further training.

A big problem, as with any new

subject, is that little research has been done and so there is a need to concentrate on filling the gap and on the Centre becoming an international "data bank" with information about arts administration in other countries, and details of all research in the subject available to both students and professional administrators.

Whether or not arts administration studies feature as a centre for the subject is secure. There are plans (another factor in the Arts Council's decision to support the university) for the arts centre at City to move into the proposed Barbican Arts Centre, where in the midst of authority of The Royal Shakespeare Company, Guildhall School of Music and Drama and the London Symphony Orchestra, it could become the first college of the arts.

General Vacancies

A job you'll enjoy

The Intellectual Challenge For Instance. As an Inspector of Taxes you will have your own job, especially when negotiating with taxpayers and their professional advisers. Your job is to determine the tax liability of both businesses and individuals which demands full use of the intellect in a highly responsible and varied environment.

The challenge is not only to you, but to the test personal qualities too—such as the ability to express your self clearly, to think on your feet, to show initiative, to be self-reliant, and, above all, judgement, in the art of knowing when to exercise a point of view and when to stick to your guns.

During your career you will expect periods in charge of the tax affairs of an entire district and you will find a fair sized staff and enjoying wide powers of decision. You may also spend periods on more specialised aspects of taxation, acquiring an enviable professional expertise—a valuable career asset.

Qualifications. Undergraduate degree with honours in the relevant discipline. Honours in Law or Honours in Economics. Further qualifications may apply.

Starting salary £20,000 per annum according to experience. However, if you already hold a degree in Law or Economics you should be starting on £23,000. By 10 years you could be in a post with the tax responsibilities of a general manager in a large company, taking you to £30,000. There are vacancies all over the country. Salaries higher in London.

To find out more, and for an invitation to visit a Tax Inspector, write to Civil Service Commission, Attention: Tax, Basingstoke House, PO 21 2R, Basingstoke, Hampshire, RG24 0NR.

HONOURS GRADUATES—a career that appeals to reason

Courses

Hawkesbury Agricultural College

A College of Advanced Education at Richmond, N.S.W. (40 miles from Sydney G.P.O.)

Graduate Diploma in Food Sciences

One year full-time (minimum) or Two years part-time (minimum) flexible postgraduate course designed to meet the needs of scientists and technologists working in the food industry

An individual programme of studies is designed to increase each student's depth of knowledge in a chosen field and to develop a broad background of understanding in related areas. All programmes include some aspects of food or dairy technology as well as material from some of the following disciplines:

- Food Chemistry
Food Microbiology
Engineering
Management
Marketing
Nutrition
Quality Assessment

Further details may be obtained from: Mr J. W. Hayaa

Hawkesbury Agricultural College, Richmond NSW 2753

Procedure and application forms are available from: The College Secretary

Applications for Spring semester, 1978, close on June 30, 1977.

Garnett College

Advanced Courses of Study in Further Education

Application is invited for the following courses: Diploma in Further Education University of London

One year full-time or three years part-time study. Relates the study of further education to contemporary educational theory and to current social, political and economic developments.

Students can further specialise in Psychology, Sociology, Philosophy, Educational Technology, Historical and Contemporary Studies, Educational Administration and Management, Aspects of Counselling, Cooperative Education and so on.

Is recognised by universities as a "qualifying" examination for courses for higher degrees for both graduates and non-graduates.

Candidates should have reasonably substantial teaching or administrative experience in further education, administration or industrial training.

Bachelor of Education Council for National Academic Awards

Three or four years' part-time study. Extends the educational studies of the Certificate in Education course. Prepares candidates for further study and research in further education.

Candidates should be serving teachers with an initial teaching qualification and a minimum of two years' experience.

Candidates should apply as soon as possible specifying the course(s) in which they are interested to: The Principal (Reference THES), Garnett College, Dawnshire House, Reckhampton Lane, London SW15 4HR (01-280 6533)

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